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HENRY TRIMBLE.

The ranks of American pharmacy have again suffered a loss, and one which, from the promise held out in a relatively short career, we cannot but term a severe one. Henry Trimble, for four years past the editor of this JOURNAL, has passed from our midst at the age of forty-five, having lived long enough to show that he could do good lasting work for his chosen profession, although he could not be said to have reached the zenith of his powers. The busy world makes small note of the death of one man, even when his sphere of activity has been a wide one, and the dropping from the ranks of a quiet scientific teacher and worker may not make much stir with the great public, may in fact pass almost unnoticed, but there are circles that will feel in his death a sense of personal loss. His power of devoted and loyal friendship to those to whom he once had given his confidence, made him a companion who will be missed sadly and not readily forgotten.

The subject of this memoir was born near Chester, Pa., on May 22, 1853, the son of Stephen M. Trimble, a member of the Society of Friends. He was brought up upon a farm, going to school in winter and working during the summer. His earlier education was obtained at the well-known Westtown Boarding School in Chester County, and at the age of nineteen he was apprenticed to learn the drug and apothecary business.

Two years later, in 1874, he entered the Philadelphia College of Pharmacy, the institution in which most of his subsequent active career was to be cast, and was graduated from the same in 1876. Desiring to supplement his course here by a fuller training he then

entered the University of Pennsylvania as a special student in chemistry, to which branch of scientific study he felt already strongly drawn. He continued here during two years, working in the analytical laboratory under the late Dr. F. A. Genth, taking the lecture courses in chemistry, mineralogy and botany, and for the last year of his time there, acting as lecture assistant to the writer of this memoir, who then held the chair of "General and Organic Chemistry" in the above-named institution.

During these years he applied himself with great fidelity and energy to the study of the several branches mentioned, and in particular, laid the foundations for that thorough acquaintance with analytical chemistry that he displayed in later years, when this became his special field of work.

When in the fall of 1878, the writer was called to the College of Pharmacy to take the lectures of the late Dr. Robert Bridges, then the Professor of Chemistry there, he took Henry Trimble as his lecture assistant there also. In this same year, 1878, he established himself in the retail drug business with his friend and classmate, C. W. Warrington, the two taking the business of their former preceptor, S. Mason McCollin, M.D., at Fifth and Callowhill Streets, in this city. In this business he soon showed that he had a practical side to his character and that he could turn his chemical education to useful account. Not satisfied with the list of preparations ordinarily made for sale by the retail druggist, he began the manufacture of artificial fruit ethers as a specialty, at first on a small scale and later in relatively large amounts. It is needless to say his products were unexceptionable in quality and soon acquired a name for themselves.

Meanwhile, the chemical laboratory of the College of Pharmacy having also come under the care of Professor Sadtler by reason of the resignation of Dr. Fred. B. Power, who had been its director for a short time, Henry Trimble was given the active supervision of this, and in 1883, having retired from active connection with the drug business, he was given the full rank and title of "Professor of Analytical Chemistry" in the institution.

From this time on, all his energies and efforts were given to this work and the literature of pharmacy and chemistry will bear witness that all too short as was his term of scientific activity, he left his mark upon their pages.

As director of the chemical laboratory, he had to plan and super-

vise the work of advanced students, and each year many original investigations in analytical chemistry and proximate plant analysis were carried out under his guidance. The list of published articles which appeared in the AMERICAN JOURNAL OF PHARMACY under his name during the years 1875–1898 was fifty-three in number.

Already in 1890, he had begun to make a special study of the class of vegetable principles known as Tannins, being incited thereto by some investigations which he had made into the methods of dyewood extract manufacture. The result of this was that in 1892 he published in a small octavo, the first volume of a work with the following title: "The Tannins, a monograph on the history, preparation, properties, methods of estimation, and uses of the vegetable astringents." In 1894 he followed this by a second volume, and at the time of his death had a large amount of unpublished notes which were meant to be used in a continuation of this unique publication. I say unique, because the work at once took rank in this country and abroad as the authoritative work on the subject, and Professor Trimble had for years carried on an extensive correspondence with botanists and chemists in all parts of the world upon what came to be known as his specialty. Both of these volumes contained a very complete bibliography of the subject, under the heading "An Index to the Literature of the Tannins," and the compilation of this bibliography involved an immense amount of painstaking care and research in the libraries of different scientific institutions and societies of this city, and examination of many foreign book catalogues.

In this connection, it should not be overlooked that Professor Trimble was an accomplished botanist, having taken special advanced instruction in this subject while a student at the University and afterwards from Professors Rothrock and W. P. Wilson.

This familiar acquaintance with the two domains of chemistry and botany made it an easy matter, therefore, for him to co-operate with his colleague, the late Prof. E. S. Bastin, in a series of joint articles on "Some North American Coniferæ," which appeared in the AMERICAN JOURNAL OF PHARMACY, and were reprinted in separate form in a pamphlet of some 124 pages.

He also became a contributor to *Garden and Forest*, published under the editorship of Professor Sargent, of Harvard University, and during the years 1894–98 furnished seven articles for this periodical. A more elaborate article on the Coniferæ was also con-

tributed by him to Sargent's monumental work, "Sylva of North America," appearing in Vol. XI.

In 1885 he published a small "Hand-book of Analytical Chemistry" for the use of his laboratory students. It ran through several editions, and was then merged into the "Text-book of Pharmaceutical and Medical Chemistry," first published by Professor Trimble and the writer jointly in 1895, and which has just appeared in a second revised edition.

Besides his activity at the College of Pharmacy, Professor Trimble also took part in the work of the Franklin Institute of this city, and several times lectured in the regular winter lecture course there. These lectures were always published in the *Journal of the Franklin Institute*.

Professor Trimble repeatedly received public honors which came to him as a recognition of his scientific attainments.

In 1895 he was selected as one of the Judges of Award for the Atlanta Exposition in the Forestry Section.

In 1896 he had the honorary degree of Master of Arts (A.M.) conferred upon him by Haverford College. His *Alma Mater* had previously (in 1891) conferred upon him the honorary degree of Master of Pharmacy (Ph.M.).

In 1897 he was elected a member of the American Philosophical Society, and because of his knowledge of the branch of sylviculture was made a member of the standing committee on the Michaux Legacy.

In 1894 he was elected editor of the AMERICAN JOURNAL OF PHARMACY to succeed the late John M. Maisch. This election at the hands of his fellow-members of the College of Pharmacy he recognized as a high honor, but at the same time as a position of large responsibility. In taking it, he determined to spare no effort to maintain the reputation given it by such predecessors in the editorial chair as Wm. Procter, Jr., and John M. Maisch, and if possible to make it still more acceptable to the pharmaceutical profession. So he threw himself with great energy into this new sphere of work. This editorial labor with the necessary correspondence and work of proof-reading for each monthly issue, which he would not delegate because of his feeling of personal responsibility proved too much for his strength already tasked quite sufficiently.

In the spring of 1897 he broke down partially and was forced

to give up some of his work. But improving somewhat, he took up his joint college and editorial work again and continued until in May, 1898, he was forced to place the editorship of the JOURNAL in other hands and seek entire rest.

But the seeds of a fatal disease were already sown, and in August came the end of his life's activity.

As before remarked, Henry Trimble has left his mark upon the literature of pharmacy and chemistry. Starting as a pharmaceutical apprentice himself and earning his way through College, every step of his career was carved out by his own exertions. His example may well be emulated by young men who start life with perhaps a fear that the difficulties ahead of them are too great and the rewards too remote or uncertain. He leaves behind him also for those who were privileged to know him well a precious recollection—that of a true-hearted and faithful friend, who was always the same and whose word could always be relied upon implicitly.

A widow and three daughters remain to cherish the memory of an affectionate husband and father. S. P. S.

PUBLISHED PAPERS OF HENRY TRIMBLE.

I. *American Journal of Pharmacy.*

1875. Assay of quinine pills.
1876. Benzoic acid as an antiseptic.
1877. Concentrated nitric acid.
Estimation of quinine.
1878. Analysis of dialysed iron.
1881. Preparation of formic ether.
1883. Milk analysis.
1884. Menthol.
1885. Glycerin vapors.
Oils of peppermint and spearmint.
Polygonum hydropiper (jointly with H. J. Schuhard).
Burdock Fruit (jointly with F. D. McFarland).
1886. Analysis of Yerba del Indio (jointly with S. S. Jones).
Analysis of Phlox carolina.
1887. Amyl acetate.
Laboratory notes.
1888. Sheperdia argentea.
Bitter principle of burdock fruit.
Catechu and gambier.
Precipitated ferrous sulphate.
Solid hydrocarbons in plants (jointly with Helen C. De S. Abbott).
1889. Canaigre.

1889. Some Indian plant foods.
Fabiana imbricata (jointly with H. J. M. Schroeter).
Oil of camphor (jointly with H. J. M. Schroeter).
Oils of wintergreen and birch (jointly with H. J. M. Schroeter).
Old sample of camphor oil (jointly with H. J. M. Schroeter).
1890. Eupatorium purpureum.
California soap plant.
Peucedanum Canbyi.
Some American galls.
Oils of wintergreen and birch (jointly with H. J. M. Schroeter).
1891. Carum Gairdneri.
Geranium maculatum (jointly with J. C. Peacock).
1892. Examination of some official preparations.
Purshia tridentata.
1893. Proximate principle from Phytolacca decandra.
Preparation of oak tannins, acetone a solvent (jointly with J. C. Peacock).
Canaigre tannin (jointly with J. C. Peacock).
1894. Four oak barks from India.
Cultivation of ginseng.
1895. Oils of wintergreen and birch.
Report on tannin from dragon's blood.
1896. Recent literature on soja bean.
Tannin of some acorns.
1897. Occurrence of strontia in plants.
Pomegranate rind.
Tannin of Castanopsis.
Tannin of Ceriops candolleana.
The soy bean.
The willow bark.
North American coniferæ (jointly with Prof. E. S. Bastin).
1898. An exudation from Larix occidentalis.

II. *In Garden and Forest.*

1894. Pin oak (Quercus palustris).
1895. On the tanning properties of the bark of three North American trees.
1896. Salt and sugar in Washingtonia filamentosa.
Tannin value of North American trees.
Tannins of the palmetto.
1897. Source of abietene.

III. *In Franklin Institute Journal.*

1887. Tannin, its present and future sources.
1892. Chestnut bark tannin.
1897. Recent advances in the study of the resins.

PROFESSOR TRIMBLE'S BOOKS.

I. *Hand-book of Analytical Chemistry*, 8vo. *P. Blakiston, Son & Co.*
1st edition, 1885.
2d edition, 1886.

3d edition, 1889.
4th edition, 1892.

II. *The Tannins—a Monograph. J. B. Lippincott Co.*

Vol. I, 1892.
Vol. II, 1894.

III. *Text-book of Pharmaceutical and Medical Chemistry (jointly with S. P. Sadtler).*

1st edition, 1895. J. B. Lippincott Co.
2d edition in two volumes, 1898. J. B. Lippincott Co.

FLUID ACETRACTS.

By Joseph P. Remington.
Research Committee E., Pharmacopœia Revision.

The title of this paper, "Fluid Acetracts," will doubtless strike the pharmaceutical reader as an innovation and inasmuch as innovations in pharmacy are resented by many, it is only proper to endeavor to forestall unfavorable criticism by giving reasons for selecting a title. To those who have followed the efforts which have been made within the last few years to call attention to the uses of acetic acid as a menstruum and solvent for organic substances, there will be no occasion to explain the meaning of the word *acetract*. We have had acetic extracts in the past, and by this term is meant a solid extract made from a drug by the use of acetic acid; the word *acetract* may simply be regarded as a contraction of the words *acetic extract*. Inasmuch as the United States Pharmacopœia of 1890 recognizes mainly alcohol and water as menstrua, it would be clearly improper to call preparations made with acetic acid, extracts and fluid extracts; for the sake, then, of avoiding confusion in nomenclature it has been deemed best to use acetract and fluid acetract to mean solid and liquid preparations of organic drugs made with acetic acid as a menstruum.

Since writing the paper on this subject (which will be found in the American Journal of Pharmacy for March, 1897), the writer has continued experiments upon a number of drugs and has had the opportunity of observing the effect of age upon these preparations. Since this paper (March, 1897) was written, the effort has been made to use as weak an acetic acid as possible and, as was anticipated,

some drugs can be very successfully exhausted with a menstruum containing as little as 5 per cent. of acetic acid; but so far, the strength which seems to be most successful is a 10 per cent. menstruum. It is not to be supposed that acetic acid can replace alcohol as a menstruum in all cases, but from the work which has already been done, the writer feels warranted in stating that fully one half of the official fluid extracts could be satisfactorily replaced by fluid acetracts. The manufacturers of specialties have not been slow to adopt acetic acid for extracting drugs, and the saving in expense has been enormous. The cost of diluted acetic acid—10 cents per gallon—as compared with that for alcohol—$2.50 per gallon—is entirely too great a temptation to resist, and a manufacturer would certainly be foolish to use alcohol except when required by the authority of the Pharmacopœia.

Sanguinaria has always presented the greatest difficulty in selecting a menstruum for the fluid extract which would not precipitate the alkaloid. I have great pleasure in stating that this question is now settled so far as obtaining a liquid preparation, which does not precipitate, is concerned. A fluid acetract of sanguinaria is herewith exhibited, a cubic centimetre representing a gramme of the drug, made on the 26th of July, 1892, and which has never at any time within the last five years, shown the slightest sign of precipitation. It seems necessary, however, to use a 60 per cent. acetic acid to accomplish this, for it will be seen by examining the samples that fluid acetract of sanguinaria, made with diluted acetic acid, contains an abundant precipitate.

The fluid acetract of ipecacuanha, made with 60 per cent. acetic acid is two years old, and seems to be in excellent condition, no precipitation being observed. The effect of acetic acid upon pectinous drugs presents some curious anomalies. Sixty per cent. acetic acid seems to act as a solvent for the pectinous principles, for, whilst weaker strengths produce liquid acetracts which will gelatinize, no tendency toward gelatinization is observed in the 60 per cent. fluid acetracts.

One fact is noticeable in light-colored preparations, that is, a tendency to darken with age. The fluid acetract of squill herewith shown, was of a light amber color when first made; in two years it has become a clear, dark red. When added to syrup, however, in the proper proportion to make syrup of squill, it will be observed

that the resulting preparation is not very different from that which is official.

Fluid acetract of ergot is very successfully made with a 10 per cent. acetic acid menstruum. Since the publication of the paper above referred to (1897), many letters of inquiry upon the subject have been received, and it is evident that acetic acid is being extensively experimented with in many laboratories. It is with a view of encouraging investigations on this subject that these papers are written, and any information in the possession of the writer will be cheerfully furnished, in the hope that sufficient experience will have accumulated in two years more, to warrant the introduction of some of these preparations in the next Pharmacopœia. Dr. Charles F. Squibb has furnished the writer with nine specimens of fluid extracts made with diluted acetic acid, which are submitted to the meeting for inspection. They are as follows: Digitalis, cascara sagrada, aconite root, nux vomica, belladonna leaf, compound gentian, gelsemium and coca. It will be observed that these represent some of the most important official drugs. They have all been made by repercolation, and on the large scale it is found that it is possible, with drugs like nux vomica, to use such, very coarsely ground instead of in fine powder, the acetic acid seeming to penetrate hard tissues and to dissolve the active constituents with great facility.

The presence of acetic acid in the finished product is, of course, sometimes objectionable. Practically, this would not be a serious fault in fluid acetracts made from powerful drugs where the dose is from 2 to 5 minims, given in water, and where only a 10 per cent. acetic acid is used for a menstruum.

CANTHARIS VESICATORIA.

By Bertram Snyder, Ph.G.

The Spanish blistering beetle belongs to the class Insecta, order Coleoptera, family Meloidæ. The following is a description of the insect (*Fig. 1*) found in commerce: Oblong, somewhat flattened above, usually ¾ inch, though often found 1 inch or more in length; $\frac{3}{16}$ to ¼ inch in breadth. The entire insect is of a brilliant metallic green color, changing in different parts, especially beneath, to a golden green. Head: triangular, and divided by a faint median

line into two lateral lobes. Mandibles stout, and partly concealed beneath the labrum. Clypens distinct. Antennæ filiform, composed of conical joints; three basal joints, green or bluish green, the remainder of a black color. Eyes comparatively small and compound, placed on the anterior portion of the lateral lobes and to the side. Ocelli absent. Thorax: the dorsal surface of the prothorax is quadrilateral, tapering from above to the sternum, having the appearance of a wedge placed between the head and mesothorax. Scutellum very small. Legs with five tarsal joints. Elytra covering the abdomen, and extending a short distance over the pleural surface. The Spanish blistering bettle, though the only one official, is by no means the only one possessing vesicating properties. It is found in the southern and central portions of Europe. In its native state

FIG. 1.—Cantharis Vesicatoria.

it chiefly feeds upon the leaves of the plants belonging to the Oleaceæ and Caprifoliaceæ, but as a larva it is parasitical. The female insect deposits its eggs during June, and the larvæ, when hatched, attach themselves to bees or other Hymenopterous insects. The insects are gathered during the early morning and late in the evening, when they are less active from the cold. The persons who gather them protect their hands with gloves and usually wear masks. The trees or shrubs are shaken, and the insects fall into sheets spread on the ground. They are killed by exposure to the fumes of vinegar or by turpentine, dried by artificial heat and packed in paper-lined boxes.

The beetles may be kept for any length of time in air-tight bottles without losing their vesicating property, but on exposure to moist

air the cantharidin is decomposed and the beetles become useless. They are also much injured by the attacks of other smaller insects, particularly by a small mite, which entirely consumes the soft inside portions, leaving the hard external shell intact. They may be preserved from these attacks to some extent by the addition of small pieces of camphor, or, better, by exposing the beetles to the vapor of pyroligneous acid.

The commonly-called Chinese blistering beetle (*Mylabris cichorii*) (*Fig. 2*) found in some portions of Southern Europe and in China, has acquired some note. The body is of an elongated oval or cylindrical form, from ¾ to 1 inch in length, and from $\frac{3}{16}$ to $\frac{5}{16}$ inch in breadth. Head of a jet-black color, somewhat triangular; maxillary palpi three-jointed; mandibles stout and large, almost concealed

FIG. 2.—Mylabris Cichorii.

beneath the labrum; clypens rather large; antennæ clavate eleven-jointed and articulated to the front of the head, below and between the eyes; eyes large and compound; the facets or corneæ are discernible with a pocket lense; they are situated on the side of the head and rather far apart; ocelli absent; prothorax decidedly wedge-shaped, of a black color with faint prominences and depressions on its dorsal surface; præscutum very small; scutellum of an oval shape; the femora of the first and second pair of legs are clothed with yellowish hairs; third pair jet black; elytra black with two broad-waved transverse bands of brownish yellow, in some species examined of a golden-yellow color; on the anterior portion of each elytom there is a circular spot of the same color; abdomen rather

large and conical, entirely concealed by the elytra, which not only project beyond the posterior portion, but also cover the sides, which is characteristic of the blistering beetles. The blistering beetles are well represented in this country, and it is to be regretted that they have not a place in the U. S. Pharmacopœia, as they are in no wise inferior to the *C. vesicatoria* in vesicating properties. The most common are *C. vitatta*, *C. cinerea*, *C. marginati*, *C. atrata*, and *C. vulnerata*. The best known is *C. vitatta* (*Fig. 3*), commonly called potato fly. It is somewhat smaller than *C. vesicatoria*, being from ½ to ¾ inch in length and about $\frac{3}{16}$ inch in breadth. It is of a black color, with the exception of ochreous markings; the under portion of the body is cinereous; head cordate of a light ochre color, with two black spots on the apex; mandibles entirely concealed by the

FIG. 3.—Cantharis Vitatta.

labrum; labial palpi two-jointed, the last joint large and flattened; maxillary palpi three-jointed; antennæ black and filiform; clypeus large; eyes large and compound, extending over the lower side of the head; prothorax elongated and much narrower than the head, of a black color, with a brownish yellow central and a faint lateral line; coxæ of the first pair of legs much elongated; the articulated portion of the femora are of an ochre color; the other portions are cinereous; scutellum small; elytra are black, with a median and marginal stripe of yellow; they slightly overlap the pleurites. The whole insect is covered with a fine pubescence.

The vesicating properties of the blistering beetles reside in a crystallizable substance termed cantharidin, and according to some writers,

in a green fixed oil; but this is no doubt due to the presence of cantharidin, which is soluble to some extent in the oil.

A portion of the powdered cantharides was treated with carbon disulphide and set aside to macerate. On decanting the liquid and subjecting it to spontaneous evaporation, a thick, dark brownish-green oleaginous matter was obtained, which was insoluble in alcohol, soluble in ether, chloroform and benzin. It melted at 18° C., below which it was solid. It was entirely soluble in excess of ether, which on partial evaporation separated out a yellowish-brown fat; when entirely evaporated and the fat separated by filtration, a light pea-green oil was obtained, which raised a small blister in eight hours without any covering, the oil being placed on the back of the hand. Alcohol and water both dissolve an extractive matter. The alcoholic extract was soluble in ether and acetic ether.

A separate portion of the powdered beetle, on treatment with chloroform, yielded, after evaporation, an abundance of crystals of cantharidin along with dark fatty matter, which was removed by CS_2 and the cantharidin redissolved in a fresh portion of chloroform and recrystallized. A small portion of this cantharidin raised a large, painful blister in four hours on the same part of the hand to which the oil was applied. The distillation of the powdered cantharides with water affords a volatile principle which is vesicating. While treating the powder that was used in the distillation with alcohol and then evaporating the solution by means of heat, I stood over it at intervals stirring with a glass rod. At night I was much annoyed by a scratching sensation in closing the lids over the eyes. Next morning intense inflammation had set in. On consulting a physician he stated that I must have been using some irritating substance in my eyes. I was compelled to stay in a dark room for twenty-four hours; for a few days after had to use a shade.

Boric acid, 6 gr., camphor water, ℥ii, and distilled water, ℥i, using three drops in each eye allayed the irritation. I noticed that the irritation of the left eye was much worse than the right. In stirring the evaporating solution I leaned on the counter with my left arm, thus exposing the left eye more to the vapor.

Camphor.—The value of crude camphor exported in 1897 from North Formosa was £121,938, the trade being mostly in the hands of German and Chinese merchants.—*Chem. and Drug.*, 1898, 256.

ANALYSIS OF THE ROOT OF HYDRANGEA PANICULATA, VARIETY GRANDIFLORA.

By August G. Luebert, P.D.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy. No. 180.

Hydrangea paniculata, variety grandiflora, is a cultivated hybrid of Hydrangea paniculata. It is a showy annual shrub, having very large panicles of sterile flowers, which open late in August, or early in September. It is one of the most commonly cultivated shrubs in the Northern and Middle States.

As far as I am able to learn, there is no record concerning the chemistry of this plant. The American Journal of Pharmacy for 1887 contains on page 122, however, an essay on the chemistry of Hydrangea arborescens, a closely allied species. Mr. C. S. Bondurant, the author of the essay just referred to, obtained, from both the alcoholic and ethereal extracts of the plant, a distinctly crystalline body; this, he proved to be a glucoside, and named it *hydrangin*. It crystallized in stellate clusters. On addition of an alkali to the aqueous solution, a very distinct and strong opal-blue fluorescence was observed; this was destroyed by acidifying. It melted at 235° C., and on increasing the temperature slightly, it sublimed without decomposition. A characteristic reaction was obtained on dissolving it in sulphuric acid, and adding a small crystal of potassium bichromate, a dark purple color being produced. This color, after some minutes, faded to violet, and, on addition of a few drops of water, changed to an olive green color, which gradually faded.

The work of the present writer consisted in making a proximate analysis of the root of the variety grandiflora. Dragendorff's method of analysis was followed. The root was reduced to No. 40 powder for this purpose.

Petroleum ether having a boiling point of 50° C. removed 1·20 per cent. of soluble matter. This consisted of wax, saponifiable fat, and caoutchouc.

Official ether extracted 2·39 per cent. of the weight of the root. The extract was granular in appearance and waxy in consistence. It had a characteristic, sweetish odor, which somewhat resembled that of the root. The extract was digested with water, and the mixture filtered. The filtrate was agitated with several successive portions of ether, the ether separated and allowed to evaporate. A

crystalline residue was obtained; it was purified by recrystallization. The crystals were similar to those obtained from the portion of the ethereal extract which was insoluble in water, but soluble in alcohol. These are yet to be described in this paper. The aqueous layer, from which the crystals had been removed by ether, was heated on a water-bath to expel the ether, and then warmed with Fehling's solution. This reagent was reduced, thus showing the presence of a sugar or a glucosidal body.

That part of the ethereal extract which was insoluble in water was entirely soluble in absolute alcohol. The solution deposited crystals on standing. These crystals gave no reactions for alkaloids. On mixing water with a portion of the crystals, and making a part of the resulting mixture alkaline with solution of sodium hydrate and applying Fehling's solution with heat, there was a reduction of this reagent. Another portion of the mixture was made acid with dilute sulphuric acid, heated on a water-bath for some time, then made alkaline and treated with Fehling's solution; the last was again reduced. The treatment with dilute sulphuric acid left a resin-like, insoluble substance of a brownish color, while the supernatant liquid acquired a decided fluorescence. This fluorescence was removable by filtration. The foregoing behaviors indicate that the principle itself reduces Fehling's solution, or that it is decomposed by alkalies and acids, with the production of a substance which reduces Fehling's solution. From a concentrated ethereal solution, the principle crystallized in branched clusters. It was charred by sulphuric acid, and upon adding a crystal of potassium bichromate, a darker color and an effervescence were produced. The principle melted at 178° C. These properties show that it is not identical with the *hydrangin* found by Bondurant. The name, *para-hydrangin*, is suggested for the substance until further investigation shall decide its exact chemical identity.

Absolute alcohol dissolved 14.49 per cent. of extract from the root. The extract was partly soluble in water; the remainder was soluble in alcohol. The aqueous solution contained some of the crystalline principle that was found in the aqueous solution of the ethereal extract. The alcoholic solution of that part of the absolute alcohol extract insoluble in water gave no precipitate with alcoholic solution of ferric chloride. Lead acetate in alcoholic solution caused a yellowish-brown flocculent precipitate. A third portion of the

alcoholic solution of the extract yielded a precipitate when mixed with water, but it could scarcely have been resin since neither aqueous nor alcoholic solution of potassium hydrate dissolved it. This extract contained 2·38 per cent. of sugars, calculated as glucose, and 0·7 per cent., calculated as saccharose.

Water removed 3·60 per cent. of organic solids from the root. This amount included 2·42 per cent. of mucilage, and a trace of dextrin. Sugars were not found in this extract.

A weak solution of sodium hydrate was the next solvent applied to the root. It extracted 15·88 per cent. of organic matter. A portion of the alkaline solution was acidified with acetic acid and precipitated with five times its volume of alcohol. A precipitate amounting to 7·30 per cent. of the root was obtained. Lassaigne's test gave no indication of nitrogen in this precipitate, consequently it was composed of mucilage.

The root yielded 4·88 per cent. of soluble organic matter to a weak solution of hydrochloric acid in water. This extract contained 2·37 per cent. of the substance known as pararabin.

Starch was present in the air-dry root to the extent of 9·46 per cent.

The air-dry material contained 7·94 per cent. of moisture, and 8·12 per cent. of ash.

The cellulose, lignin and allied substances amounted to 32·04 per cent.

SUGGESTED PROCESS FOR DEODORIZED TINCTURE OF OPIUM.[1]

By E. L. Patch.

At the Montreal meeting I was requested to report upon this process which was stated to be as follows:

Granulated opium	100 grammes.
Benzinum U.S.P.	400 c.c.

Macerate 24 hours and decant. Macerate residue with 200 c.c. of benzine for 24 hours, decant upon a filter, wash the filter with 200 c.c. of benzine and dry the opium at a gentle heat. Macerate the opium in 300 c.c. of warm water for 24 hours, transfer to a perco-

[1] Presented at the Baltimore Meeting of the American Pharmaceutical Association.

lator, wash with warm water to 800 c.c., add 200 c.c. of alcohol, filter and assay.

The supposed advantages of the process consist in the use of benzine in place of the more costly ether for the removal of narcotine, etc., and the employment of a granulated opium in place of the fine powder. The official process allows 200 c.c. of ether for washing 100 grains of opium. The suggested process allows 890 c.c. of benzine. The relative solubilities of morphine and narcotine in various solvents, are stated to be as follows:

	Morphine.	Narcotine.
Cold water	1 in 33,000	1 in 25,000
Boiling water	1 " 500	1 " 7,000
Cold alcohol	1 " 40	1 " 80
Boiling alcohol	1 " 30	1 " 20
Amyl. alcohol	1 " 400	1 " 300
Chloroform, U.S.P.	1 " 175	1 " 3
Ether	scarcely soluble	1 " 166
Benzole	" "	1 " 22
Benzine	" "	scarcely soluble

Different observers do not agree upon the solubility of these bodies and their solubility appears to be largely influenced by physical condition, while the stated solubilities are those of pure alkaloids and not of the combinations existing in the drug.

The morphine existing in the drug as meconate, a salt quite readily soluble in water and alcohol, may be more soluble in other solvents than is generally understood. The narcotine existing in a free condition, has nearly the same range of solubilities as given for the pure alkaloid. In exhausting the opium with water a large proportion of the narcotine is supposed to be rejected. In exhausting first with ether, 100 grammes of opium, containing 6 grammes of narcotine, would theoretically require about 1,000 grammes of ether, or ten times its weight, and an indefinite quantity of benzine.

Benzinum.—The benzine of the pharmacopœia is defined as a transparent, colorless, *odorous* liquid, of sp. gr. from 0·670 to 0·675 and boiling point of 50° to 60° C. It should evaporate without residue.

Sample No. 1.—Purchased as benzine, had a sp. gr. @ 15° C. of 0·6914.

1000 c.c. yielded 30 c.c. of distillate below 50° C.
165 c.c. between 50° and 60° C.
195 c.c. " 60° " 73° C.
610 c.c. above 73° C.

Sample No. 2.—Purchased as gasoline, had a sp. gr. of 0·6886 @ 15° C.

1000 c.c. yielded 95 c.c. of distillate below 50° C.
190 c.c. " " between 50° C. and 60° C.
375 c.c. " " " 60° C. and 73° C.
340 c.c. " " above 73° C.

Sample No. 3.—Purchased as gasoline, had a sp. gr. of 0·650 @ 15° C.

1000 c.c. yielded 750 c.c. of distillate below 50° C.
140 c.c. " " between 50° C. and 60° C.
60 c.c. " " " 60° C. " 73° C.
50 c.c. " " above 73° C.

The mixed fractions boiling below 60° C. forming a mixture having a sp. gr. of 0·6450 @ 15° C. was employed in the process.

Experiment No. 1.—500 grammes of No. 40 opium, assaying 16·1 per cent. morphine, was treated exactly as suggested in proposed process. The benzine-washed opium was dried in a drying closet at 55° C. for three days, then made into 5000 c.c. of deodorized tincture, sample of which is submitted as No. 6.

It assayed but 1·334 per cent. morphine. The ether washings from 100 c.c. used in assay gave a residue of 0·720 yielding an abundance of narcotine. The finished product has an odor of gasoline. It is evident that more benzine must be used, that it is very difficult to get rid of the odor, and that instead of instructing to percolate 100 grammes to 800 c.c., the directions should be to percolate to *exhaustion*, evaporate to 800 c.c. and add 200 c.c. of alcohol. It is difficult to decant the benzine without carrying through the filter some portion of the opium in suspension, as noted in the accompanying sample of benzine washings.

Experiment No. 2.—100 grammes of No. 40 opium, assaying 16 per cent. morphine, was macerated with frequent shaking for 24 hours in 700 c.c. of benzine, the benzine decanted, the residue macerated 12 hours with 350 c.c. of benzine, the benzine decanted, the residue washed upon a filter with 350 c.c. of benzine and the opium dried several hours at 70 C. The residual opium weighed 91 grammes. If there had been no loss of morphine in the process, it should have assayed 17·58 per cent. by the equation

91 grammes : 100 grammes : : 16 per cent. : 17·58 per cent.

It did assay 16·54 per cent., showing an appreciable loss. The

benzine washings evaporated gave 8·17 grammes of residue, containing crystals of narcotine. This benzine residue washed with water and the water washings evaporated, gave 0·280 grammes of residue free from morphine. The benzine residue washed with water acidulated with 2 per cent. of sulphuric acid, the washings neutralized with ammonia and extracted with ether chloroform, 0·180 grammes of alkaloid was obtained, which gave reactions for narcotine.

A sample of this benzine washed No. 40 opium is submitted, marked and numbered No. 3. Made into deodorized tincture standardized at 1·3 per cent; it has a foreign odor and is not satisfactory. See sample of deodorized tincture No. 3.

Experiment No. 3.—A quantity of natural opium assaying 12.8 per cent., was cut into very thin slices and extracted with twenty times its weight of cold water, used in successive portions in an agitator. The cold water solution was evaporated to syrupy consistence and shaken with a large excess of benzine. It emulsified badly and was separated only after the expenditure of much time and patience. After separation the benzine was expelled from the residue by continuous heat with stirring, upon a steam bath. The residual extract was 56 per cent. of the weight of the original opium. If no loss had occurred, it should have assayed 22·85 per cent. It did assay 18·47 per cent. A sample of this extract is submitted with a sample of deodorized tincture marked and numbered No. 7.

It is known that the opium is more readily extracted with warm water, but more coloring matter and odorous principle pass into solution by use of heat. To compare the use of other solvents further experiments were conducted, as follows:

Experiment No. 4.—100 grammes of No. 40 opium, 16 per cent., washed with 1400 c.c. of ether, as in experiment No. 2. The ether washed opium weighed 80·5 grammes. If there had been no loss it should have assayed 19·87 per cent. of morphine. It did assay 18·12 per cent. Sample of this ether-washed opium and of deodorized tincture made from it, are submitted, marked No. 1.

Experiment No. 5.—100 grammes of No. 80 opium 16 per cent., treated as above, gave 78 grammes of residual opium assaying 19·14 per cent. in place of 20·51 per cent. that it should assay if there had been no loss.

Experiment No. 6.—A quantity of natural opium assaying 12·8

per cent. morphine, extracted with cold water, the washings evaporated to very soft extract, the extract redissolved in ten times its weight of distilled water, filtered from precipitated matter, concentrated to syrupy consistence, washed with ether until 10 c.c. of ether washings evaporated in a porcelain capsule gave only a slight residue, the opium solution evaporated to an extract, the extract weighed 53 per cent. of the original opium and assayed 20 per cent. morphine, in place of 24·15 per cent. that it should assay if no loss had occurred in the exhausting, heating, precipitating, etc. This extract is very clean, entirely soluble in a mixture of water four volumes and alcohol one volume, and yields a very superior deodorized tincture. A sample of the extract, one of the extract reduced to 14 per cent. with milk sugar, and of the deodorized tincture made from the extract, are submitted. It is evident that the 200 c.c. of ether used for washing 100 grammes of opium in the official process for deodorized tincture, is insufficient. There is no uniformity in quantity required on account of difference in character of the opium employed. Sample of deodorized tincture marked B. has had three ether washings, and sample C. the same number, while sample D. has had six. Comparison of these samples will show their variation in character.

It would be better if the U.S.P. directed repeated ether washings in its process for deodorized tincture, or washing until slight residue is obtained on evaporation of 10 c.c. of ether washing, if any uniformity in product is intended. To ascertain if loss in these processes came from imperfect exhaustion in using gum opium, 25 pounds of natural opium, assaying 13 per cent., was washed with two successive portions of lukewarm water, each portion four times the weight of the opium used. Assay showed 1·7 pounds loss. Further washing with three additional washings gave 0·8 pounds as loss. Duplicate experiments gave very similar results.

Experiment No. 7.—100 grammes of No. 40 opium assaying 16 per cent. was extracted with redistilled acetone of sp. gr. 0.8172 @ 15° C., as in Experiment No. 2. The residual opium weighed 74 grammes and assayed 19·34 per cent. morphine, in place of 21·62 per cent. that it would have assayed if there had been no loss. The residue retained the acetone odor after long heating at 70° C., and subsequent exposure to the air. The deodorized tincture made from it retains the acetone odor. Sample of the acetone washings,

of the acetone-washed opium No. 4, and of deodorized tincture made from it, are submitted.

Experiment No. 8.—100 grammes of No. 40 opium assaying 16 per cent., washed with methyl acetate, freshly redistilled, of sp. gr. 0·9268 @ 15° C. gave 77·5 grammes of residue assaying 19·6 per cent., instead of the 20·64 per cent. it would have assayed if no loss had occurred. The methyl acetate odor persistently adhered to the residue, and after several months' standing is apparent in the deodorized tincture made from it. Sample of the methyl acetate washings, the residual opium and deodorized tincture made from it, are submitted, marked and numbered 5. The various morphine residues obtained in the assays are submitted for comparison.

A.—The ether washings from 100 grammes of No. 40 opium, Experiment No. 4, evaporated to dryness, the residue extracted with water and submitted to morphine assay, gave 0·0155 gramme. The water-washed residue washed with 2 per cent. sulphuric acid, the acid washings neutralized with ammonia and washed out with ether-chloroform, gave 4·425 grammes of alkaloids testing for narcotine.

B.—The ether washings from 100 grammes of No. 80 opium, Experiment No. 5, treated in the same way as *A*, gave 0·0145 gramme of morphine and 4·435 grammes of alkaloids (narcotine, etc.).

C.—The acetone washings from 100 grammes of No. 40 opium, Experiment No. 7, treated in the same way as *A*, gave 0.580 gramme of morphine and 4·860 grammes of alkaloids (narcotine, etc.).

D.—The methyl acetate washings from 100 grammes of No. 40 opium, Experiment No. 8, treated in the same way as *A*, gave 0·080 morphine and 5·160 of alkaloids (narcotine, etc.).

COMPARISON.

Lots of 100 grammes of No. 40 opium assaying 16·1 per cent. morphine, washed respectively with 1400 c.c. of benzinum, ether, acetone and methyl acetate, gave the following results:

	Benzine.	Ether.	Acetone.	Methyl Acetate.
Weight of extracted and dried opium .	91·00	80·500	74·	77·50
" " morphine in " " .	15·05	14·580	14·310	15·19
" " " " washings . . .	none	·015	·580	·08
" " narcotine, etc., in washings .	·18	4·425	4·860	5·16

CONCLUSION.

Benzinum, or petroleum ether, is not adapted for use in washing narcotine, etc., from opium in making deodorized tincture, on account of its uncertain character, its low range of solvent power, and its disagreeable odor. Methyl acetate or acetone are much better because of greater uniformity and greater solvent power, but are inferior to ether because of their disagreeable odor.

QUALITATIVE EXAMINATION OF POWDERED VEGETABLE DRUGS.

By Henry Kraemer.

(*Continued from No. 10, p. 521.*)

GROUP No. 3. COLOR, SOME SHADE OF YELLOW.

Washed sulphur, Sulphur præcipitatum, U.S.P. (Lac Sulphur or Milk of Sulphur), Mastic, Glycyrrhiza (Russian), Aurantii amari cortex, Scammony resin, Resina, Lycopodium, Sandarac, Sinapis alba, Dextrin (yellow), Aurantii amari cortex, Aurantii dulcis cortex, Ammoniac, Limonis cortex, Zingiber (Jamaica), Calendula, Angustura bark, Tr. Rhei Dulc., Rhamnus purshiana, Tr. Rhei Arom., Rheum, Hydrastis, Resina podophylli, Aloes (Cape), Chrysophanic acid, Gamboge, Turmeric, Yellow ochre, (Argillaceous or Calcareous earth, Fe and Mn oxides), Curry powder.

I. POSSESSING VEGETABLE TISSUES OR CELL CONTENTS.

A. CELL-CONTENTS ALMOST ENTIRELY.

a. Starch grains.

204. *Dextrin.*—Altered and unaltered starch grains.

b. No starch.

205. *Lycopodium.*—Characteristic spores entirely.

B. CELL-CONTENTS AND VEGETABLE TISSUES.

a. Without any or but little starch.

206. *Aurantii Amari Cortex.*—Thick-walled parenchyma (walls 10–15 μ thick); oil secretion reservoirs (120 μ in diameter); few ducts; brownish-green outer layer; crystals of calcium oxalate cubical (15 x 15 μ).

207. *Aurantii Dulcis Cortex.*—Parenchyma cells with walls not so thick as the bitter orange peel, being 4 μ thick; secretion reservoirs

about 350 μ in diameter; few ducts; outer layer orange-yellow; crystals of calcium oxalate either cubical (30 x 30 μ), or prismatic, as in quillaja (35 x 10 μ); likely to find sphere crystals of carbohydrate in glycerin mounts.

208. *Limonis Cortex.*—Secretion reservoirs as large as in sweet orange peel; outer layer pale (lemon) yellow; walls of parenchyma 5 μ thick; calcium oxalate crystals, about as in bitter orange peel; sphere crystals, as in sweet orange peel.

209. *Sinapis alba.*—Oil, aleuron and characteristic seed coat.

210. *Calendula.*—Characteristic tissues of petals containing oily drops; few pollen grains; reaction with H_2SO_4.

b. Containing starch.

a. Without crystals of calcium oxalate.

211. *Hydrastis.*—Starch 4 μ; wood fibres and ducts yellowish; few, sometimes numerous prismatic crystals in a rosette = berberine; upon addition of H_2SO_4 get abundant needle-shaped crystals.

β. With crystals of calcium oxalate.

* Crystals very small and likely to be overlooked.

212. *Zingiber* (Jamaica).—Unaltered starch grains 15 x 30 μ; yellowish (oil) and reddish (resin) cells; fibrovascular tissue.

213. *Turmeric.*—Altered starch grains (test with iodine) in irregular masses (70 x 100 to 100 x 140 μ) of shape of cell in which formed; bright yellow oil secretion cells; pigment dissolved out by use of solutions of chloral or chloral-glycerin, as well as when essential oils are employed; characteristic color reaction with H_2SO_4, or with boric acid + HCl, and then evaporate with NH_4OH.

214. *Curry Powder.*—A powder of varying composition, but generally find the following: characteristic yellow secretion cells and starch of *ginger* and *curcuma;* oil and seed coat of *mustard;* aleuron and oil secretion reservoirs of *coriander;* may find sklerenchyma of *Pimenta* or *cloves.*

** *Crystals of calcium oxalate rosette-shaped and numerous.*

215. *Rheum.*—Crystals 70 μ; starch grains, single, 20 μ, or double 35 x 20 μ; boil a few milligrammes of the powder with water, filter, and to the straw-colored solution add KOH = red coloration.

216. *Tr. Rhei Aromatica.*—Chiefly the characteristics of *Rhubarb* (see No. 215); crystals (10 μ), and oil secretion reservoirs of *cloves* (see No. 346); tissues of *cinnamon* (see No. 292) and *nutmeg* (see No. 496).

217. *Tr. Rhei Dulcis.*—Characteristic aleuron, non-secreting hairs and secretion reservoirs of *anise;* seed coat and crystals of *cardamom,* crystals in crystal fibres of *glycyrrhiza*; crystals and starch of *rheum.*

219. *Rhamnus Purshiana.*—Rosette-shaped and cubical crystals; bast fibres (more numerous than in Frangula); stone cells (which are absent in Frangula); a few milligrammes of powder boiled with water, filtered and the straw-colored filtrate, treated with KOH, gives a red color.

**** Crystals cubical, tetragonal or coffin-shaped and numerous.*

220. *Calumba.*—Stone cells contain tetragonal crystals; starch grains. (See No. 24.)

221. *Glycyrrhiza* (Russian).—Numerous sklerenchyma fibres, adjoining which are crystal fibres containing tetragonal and coffin-shaped crystals; few cork cells, distinguishing it from Spanish (which see, No. 275); some parenchyma cells contain glycyrrhizin, and are colored straw-yellow with H_2SO_4.

***** Needle-shaped crystals.*

222. *Angustura.*—Stone cells; bast fibres; long yellow secretion reservoirs; yellowish (oil) and reddish-brown (resin) masses.

II. FEW OR NO FRAGMENTS OF VEGETABLE TISSUES.

A. BURN, GIVING OFF ODOR OF SO_2.

223. *Sulphur Lotum.*—Small rounded masses in chains.

224. *Sulphur Præcipitatum.*—Small rounded masses in irregular groups in glycerin mounts.

B. ON BURNING DO NOT GIVE OFF ODOR OF SO_2.

(*a*) *Nearly colorless in glycerin mount.*

225. *Mastic.*—Transparent irregular masses.

(*b*) *Yellowish in glycerin mount.*

(*a*) *Containing oil globules.*

226. *Scammonium.*

β. *Transparent or translucent.*

227. *Resina.*—Irregular masses, soluble in cold alcohol (95 per cent.), forming a straw-colored liquid, becoming milky-white on addition of water; on heating fragments of resin in water, they melt, run together and form a sticky mass.

228. *Sandarac.*—Almost insoluble in alcohol (95 per cent.), and

solution remains almost colorless; on heating fragments in water, do not melt.

229. *Resina Podophylli.*—Very small more or less globular particles frequently massed together in large masses.

230. *Aloes (Cape).*—In glycerin mount some fragments are conchoidal; the particles become clear and dissolve, leaving a few colorless lens-shaped or fine acicular crystals. The latter are more abundant in the Barbadoes aloes.

231. *Chrysophanic Acid.*—Small, colorless and yellowish irregular masses, with KOH, becomes yellow and then crimson-red.

(γ) *More opaque.*

232. *Ammoniac.*—Irregular, faint yellow, opaque masses, made up of small, light-colored or grayish particles.

233. *Gamboge.*—Irregular, bright yellow masses, made up of small yellow particles.

GROUP No. 4. COLOR TAN, BUFF, ECRU TO DARK BROWN OR BROWNISH, BLACKISH AND BLUISH BLACK.

Belladonnæ radix, Ipecac (Rio), Ulmus, Galla (Aleppo), Canella alba, Calamus, Quillaja, Physostigma, Wheat middlings, Elaterium, Althæa, Bryonia, Benzoin, Lappa, Althæa (unpeeled), Apocynum cannabinum, Apocynum androsæmifolium, Apocynum album, Horse nettle, Hydrangea arborescens, Pulv. Ipecac. et Opii, Pulv. Jalap. Co., Asclepias, Jalapa, Colchici cormis, Quassia, Inula, Aurantii amari cortex, Aurantii dulcis cortex, Limonis cortex, Pulv. Morph. Co., Pyrethrum, Aconitum, Podophyllum, Pareira brava, Rubus, Gelsemium, Euonymus, Ext. Sarsap. Fld. (powder), Ipecac (Carthagena), Cardamom (seeds and capsules), Cardamom, Vanilla and Sugar, Cort. Myrica cerifera, Lappa, Cusso, Sumbul, Sambucus, Taraxacum, Zingiber (African), Pulv. Glycyrrh. Co., Asafetida (stony), Glycyrrh. (Spanish), Zingiber (Jamaica), Tr. Gentian. Co. (powder), Phytolacca, Syr. White Pine Comp., Anthemis, Gossypii rad. cort., Rumex crispus, Goa powder, Gentian, Santonica, Valeriana, Cascarilla, Xanthoxylum (Southern), Foeniculum, Tonka, Tobacco (pipe), Sabina, Rosa centifolia (pale), Chenopodium, Sarsaparilla (American), Xanthoxylum, Aralia spinosa, Zingiber (African), Insect powder (Dalmatian), Viburnum prunifolium, Aspidosperma, Powd. Opium, Cinnamon (Ceylon), Cinnamon (Saigon), Tr. Cardamom. Co. (powder), Tr. Lavandula. Co. (powder), Aloes and Canella,

Ext. Glycyrrhizæ, Tr. Catechu Co. (powder), Carum, Foeniculum, Pulv. Aromaticus, Coriander, Pimenta, Tobacco (cigar), Colchici sem., Guarana, Myristica, Caryophyllus, Cinnamon (Saigon), Cinchona nigra, Sassafras, Cinnamon (Cassia), Cinnamon (Ceylon), Quercus alba, Viburnum prunif., Cinchona flava, Tr. Cinch. Co. (powder), Composition (powder), Prunus virg., Geranium, Stillingia, Iris, Aloes (Barbadoes), Aloes (Soc.), Aloe et Canella (Hicra picra), Catechu, Cantharides (Russian), Clove stems, Goa powder, Cinnamon (Cassia), Conium fruit, Cubeb, Catechu, Larkspur seed, Corn Smut, Powder of Charcoal, Magnesia and Ginger, Willow charcoal, Amylum iodatum.

I. ANIMAL TISSUES.

Fragments on being ignited on platinum foil give off odor of burning animal substance.

A. DO NOT COLOR MOUNTS OF GLYCERIN OR GLYCERIN + CHLORAL.

234. *Cantharis* (*Russian*).—Not hairy.

235. *Mylabris Cichorii.*—Very hairy.

B. GLYCERIN MOUNTS COLORED A CARMINE RED.

236. *Coccus.*

II. PRESENCE OF VEGETABLE TISSUES BUT NO FIBRO-VASCULAR ELEMENTS.

237. *Ergota.*—See No. 1.

III. FIBRO-VASCULAR ELEMENTS AMONG OTHER VEGETABLE TISSUES.

A. CONTAINING STARCH.

a. Possessing calcium oxalate crystals.

a. Crystals rosette or star-shaped.

238. *Althæa* (*peeled*).—Crystals 25 μ; starch 14 x 10 μ; sklerenchyma fibres; mucilage; crystals of asparagin.

239. *Althæa* (*unpeeled*).—As No. 238 but with appreciable quantity of cork cells.

240. *Aralia nudicaulis.*—See No. 2.

241. *Aralia spinosa.*—See No. 3.

242. *Asclepias.*—Crystals 35 μ (sometimes not numerous); starch 7 μ; numerous stone cells.

243. *Cascarilla.*—Crystals 15–20 μ; starch 3 μ; reddish brown secretion cells; sklerenchyma fibres.

244. *Canella alba.*—Crystals 20–30 μ; starch single to 3-compound (5 μ in diameter); large yellowish oil secretion reservoirs; peculiar stone cells thickened on but three sides.

245. *Composition powder.*—Starch, oil cells and crystals of Ginger (see No. 212); crystals and oil secretion reservoirs of cloves (see No. 346); oil and chromoplastids of capsicum (see No. 306); bayberry bark with characteristic crystal fibres and starch grains 7 μ.

246. *Euonymus.*—Crystals 20–35 μ; starch 4 μ; characteristic groups of bast fibres with 5–8 rows of medullary rays.

247. *Galla (Aleppo).*—Crystals 10 μ; starch single grains (10 μ) or sometimes in groups; stone cells; tannin; crystals of gallic acid.

248. *Geranium.*—Crystals, 60 μ; starch, 10–15 μ; numerous yellowish and reddish-colored masses in cells; strong reaction for tannin.

249. *Gossypii Radicis Cortex.*—Crystals, 25 μ; starch, single (4 μ) to 3 to 4 compound (20 μ) grains; long bast fibres about 6 m.m. long; secretion reservoirs; reddish and yellowish-colored masses.

250. *Jalapa.*—Crystals, 30–35 μ; much starch of characteristic form (18–36 μ); yellowish-brown secretion cells, as well as other characteristic, somewhat thickened cell with simple pores.

251. *Juglans.*—Crystals generally rosette-shaped (15–35 μ) or sometimes tetragonal (10 x 15 μ), occurring in parenchyma or occasionally in crystal fibres; bast fibres, 30 μ wide and very long; stone cells, 35 x 50 μ; oily drops and purplish-brown tannin masses in parenchyma. *J. cinerea*, L., is distinguished from *J. alba*, Mx., and *J. nigra*, L., in that each of the latter possesses numerous crystal fibres containing prismatic or rhombohedral crystals. *J. nigra* has also in the medullary rays rosette-shaped crystals of calcium oxalate. *Juglans regia* appears more nearly to resemble *J. cinerea*, L. See Vogl.

252. *Myrica cerifera.*—Crystals either rosette-shaped (45 μ) or nearly cubical (15 x 15 μ to 15 x 20 μ), occurring in crystal fibres (as in licorice) accompanying the long bast fibres, which are as many as 100 μ in width and walls about 25 μ thick; starch either single (7 μ) or 2 to 4 compound.

253. *Podophyllum.*—Crystals, 50 μ in diameter; starch either

single grains (5–8 μ), or 2 to 6 compound; numerous single yellow cells or groups of the same; sklerenchyma fibres and ducts.

254. *Pimenta.*—Crystals, 15 μ; starch, 7–10 μ; stone cells characteristic; oil secretion reservoirs are wine-colored and characteristic.

255. *Pulv. Aloe et Canellæ* (*Hicra Picra*).—In addition to Canella alba (see No. 244) there is aloes, the appearance of which depends on the kind used (see Nos. 230, 486 and 487).

256. *Pulv. Jalapæ Co.*—In addition to Jalapa (see No. 250) has large irregular transparent crystals of potassium bitartrate (see No. 186).

257. *Pulv. Rhei Comp.*—Crystals and starch of Rheum (see No. 215); oil and starch of ginger (see No. 212), and crystals MgO (see No. 197).

258. *Hufland's Baby Powder.*—Crystals and starch of *Rheum* (see No. 215); carbonate of magnesia and sugar (as Oleo-sacch. of Fennel).

259. *Rubus.*—Crystals, 30 μ; starch 7 μ; long bast fibres, 7 mm. long; reddish and yellowish-colored masses.

260. *Rumex crispus.*—Crystals, 20–35 μ; starch, 10–18 μ; stone cells and sklerenchyma fibres; boil few milligrammes with water, filter and to straw-colored liquid add KOH = red chrysophanic acid reaction. In *Rumex hymenosephalus* starch grains characteristic, 4 x 8 to 7 x 16 μ; apparently no crystals.

261. *Serpentaria.*—Sometimes contains crystals (see No. 245).

262. *Stillingia.*—Crystals not numerous apparently (35 μ); starch (15 x 15 to 25 x 30 μ); sklerenchyma fibres very long, diameter, 20 μ; walls swell very perceptibly in KOH; oil secretion cells containing oil and reddish resin masses.

263. *Syr. Trifolii Comp.*—Rosette crystals, etc., of *Stillingia* (see No. 262); cubical crystals, stone cells and oil secretion reservoirs of *Xanthoxylum fraxineum* (see No. 29); tissues of *Lappa* (see No. 113); *Phytolacca* (see No. 301); *Berberis aquifolium* (see No. 557); *Cascara amarga* and *Red clover.*

264. *Sarsaparilla* (*American*).—See Aralia nudicaulis, No. 2.

265. *Viburnum prunifolium.*—Crystals, either rosette-shaped (35 μ) or cubical (15 μ), or somewhat coffin-shaped, occurring in crystal fibres like in licorice; numerous groups of yellowish stone cells (20 x 140 μ) of various shapes of numerous light cork cells;

more stone cells and fewer sklerenchyma fibres in *V. prunifolium* than in *V. opulus.*

266. *Syr. White Pine Compound.*—See No 285.

β. Tendency of crystals to cubical, tetragonal, hexagonal, or coffin-shape.

267. *Aspidosperma.*—Crystals, 14–25 μ, in crystal fibres about 8 mm. long, very characteristic.

268. *Calamus (peeled).*—Few crystals 7 x 10 or 5 x 5 μ in crystal fibres in outer part of cortex; sometimes get large acicular crystals in glycerin mounts about 55 μ long, which may be, however, 400 μ long; starch, 4 x 4 to 4 x 8; parenchyma characteristic; oil secretion cells; ducts and sklerenchyma.

269. *Calamus (unpeeled).*—More crystal fibres like in licorice and Uva ursi. (See No. 268.)

270. *Cardamom.*—Crystals very small; starch in small grains, often in groups; thick, dark sklerenchyma being the outer and particularly the inner epidermis of the seed; the pericarp or fruit wall possesses sklerenchyma fibres and large parenchyma cells, some of which contain brown masses. The *Malabar* is distinguished from the *Ceylon* in that the latter has some 1-celled hairs; crystals are larger and more numerous; starch grains are larger; the outer epidermal cells are larger and contain one or more nearly cubical or hexagonal crystals. (See also Vogl and Mœller.)

271. *Cinnamon.*—See No. 292, sometimes find prismatic crystals.

272. *Ext. Glycyrrhizæ.*—Irregular wine-colored fragments; starch grains altered and unaltered; few fragments of sklerenchyma and crystal fibres of glycyrrhiza. (See No. 276)

273. *Ext. Sarsaparillæ Fld.*—Abundance of tissues and starch grains of sarsaparilla (see No. 40); sklerenchyma and crystal fibres of glycyrrhiza (see No. 275); tissues of sassafras (see No. 313); and mezereum (see No. 524).

274. *Frangula.*—Rosette-shaped crystals, 70 μ, cubical, pentagonal and hexagonal crystals (7 x 5 μ to 8 x 8 μ) in parenchyma cells or crystal fibres; starch grains not numerous, the grains occurring either singly or in groups; long, numerous bast fibres 15 μ wide; after section or powder lies in glycerin get numerous small globular and yellowish particles; boiling a few milligrams of the powder with water, filtering, and to the straw-colored liquid adding KOH gives a red coloration. Absence of stone cells in *Frangula* distinguish it from *Rhamnus Purshiana.*

275. *Gelsemium.*—Crystals cubical (15 x 15 μ), tetragonal (15 x 20 μ) or prismatic (8 x 28 μ); starch grains 8 x 8 μ; numerous sklerenchyma fibres. Stem is distinguished from the root by the presence of groups of more or less altered sieve (*i.e.*, internal phlœm). Rhizome is distinguished from overground stem by the former having a stronger cork development and the latter chloroplastids.

276. *Glycyrrhiza* (*Spanish*).—Crystals of varying shapes, about 3 x 2 μ, occurring in crystal fibres in fragments of about 117 μ in length; starch grains about 5 μ in diameter; ducts and numerous sklerenchyma fibres. Spanish licorice is distinguished from the Russian in that a powder of the former is darker, due to the fact that the cork is retained and hence cork cells are relatively more numerous.

277. *Ginger, Charcoal and Magnesia.*—Few starch and oil secretion cells of ginger (see No. 212); crystals of MgO (see No. 197), and large number of wine-colored or blackish wood fragments.

278. *Hufland's Baby Powder.*—Crystals and starch of rheum (see No. 215), crystals of MgO (see No. 197) and sugar (see No. 185).

279. *Iris.*—Crystals of shape like those of Quillaja; they arise in the intercellular spaces, and in powder are in broken pieces about 20 x 150 μ in size; parenchyma loose; cells contain reddish resin; ducts numerous.

280. *Krameria.*—Large crystals in shape like Quillaja, ranging from 10 x 45 to 25 x 110 μ, or even larger; starch 20–30 μ; bast fibres 400 to 875 μ long; about 15 μ wide and with a peculiar crook or bend; parenchyma containing bright, reddish-brown coloring substance. Bast in *Savanilla* rhatany longer and broader than *Peruvian* (see also Vogl).

281. *Myrica cerifera.*—See No. 252.

282. *Prunus Virginiana.*—Crystals rosette-shaped, cubical or hexagonal (20–30 μ); starch 4 μ; stone cells; bast fibres; taste and odor.

283. *Pulv. Glycyrrhizæ Co.*—Tissues of glycyrrhiza (see No. 275), and senna (see No. 21). Make chrysophanic acid test.

284. *Quillaja.*—Crystals prismatic varying from 15 x 60 to 35 x 100 μ, or even larger; starch 10 μ; sklerenchyma fibres; parenchyma with yellowish resin.

285. *Syr. White Pine Comp.*—Crystals, fibres and stone cells of *wild cherry* (see No. 281); characteristic crystals, etc., of *Aralia*

spinosa (see No. 3); tissues of *sassafras* (see No. 313), sanguinaria (see No. 222), white pine bark and balm of gilead buds.

286. *Ulmus.*—Hexagonal or coffin-shaped crystals 8 x 25 μ; starch 5–7 μ; groups of bast fibres and characteristic large mucilage cells.

287. *Viburnum Opulus.*—Crystals cubical (2 x 2 μ) or broadly prismatic (10 x 20 μ) in crystal fibres. More sklerenchyma fibres in *V. Opulus* than in *V. prunifolium.* (See No. 265.)

288. *Viburnum prunifolium.*—See No. 265.

289. *Xanthoxylum.*—Tetragonal crystals 10 x 25 μ; starch 4–10 μ; large colorless secretion reservoirs; reddish cork; acicular crystals separate in glycerin mounts; apparently no bast or stone cells as in *X. fraxineum.* (See Mœller.)

γ. *Raphides (or needle-shaped crystals) of calcium oxalate.*

290. *Cacao.*—Acicular crystals of theobromine and fat. (See No. 545.)

291. *Calamus.*—Acicular crystals in glycerin mount. (See No. 268.)

292. *Cinnamon.*—Raphides of calcium oxalate; stone cells; bast fibres; starch grains. The different cinnamons are distinguished in powder in that the *Ceylon* has little or no cork; *Cassia* has more lignified cells than *Saigon; Saigon* is more aromatic and pungent. The mounts of Ceylon cinnamon are lighter in appearance than those of either of the others. Regarding other characteristics the following may be of some service in distinguishing these barks; *Cassia* has, on an average, starch grains 7 μ diameters; stone cells 60 μ wide; bast fibres 700 μ long; *Ceylon* has starch grains 3–7 μ diameter; stone cells 70 μ wide; bast fibres 60–100 μ long; *Saigon* has starch grains 10 μ diameter; stone cells 85 μ wide; bast fibres 750 μ long.

293. *Hydrangea arborescens.*—Needles 200 μ long; starch 4–15 μ; numerous sklerenchyma fibres.

294. *Ipecac.*—Acicular crystals 20–40 μ long; starch in single and 2–3 compound grains; tracheids, but no true ducts. Starch grains of *Rio Ipecac* on average 4–7 μ, may be 14 μ; that of *Carthagena* varies from 4–15 μ, the grains being uniformly larger. *Richardsonia* has true ducts.

295. *Pulv. Aromaticus.*—Tissues and cell-contents of Cinnamon (see No. 292) and Ginger (see No. 212) predominating; also Cardamom (see No. 23) and Nutmeg (see No. 496):

296. *Pulv. Ipecac. et Opii.*—Crystals of sugar-of-milk predominating (see No. 190); also Ipecac (see No. 294) and Opium (see No. 222).

297. *Tr. Catechu Comp.*—Tissues, etc., of Cinnamon (see No. 292) and Catechu (see No. 222).

δ. Crystal sand. (May occur as acicular crystals also.)

298. *Belladonnæ Radix.*—Starch in single (5–15 μ) and 2–3-compound grains; rather narrow ducts, with bordered pores; few sklerenchyma fibres; grayish-brown resinous masses. *Woody Belladonna* has more numerous ducts and sklerenchyma fibres; *Mealy B.* is richest in starch, and *Horny B.* is richest in grayish-brown resinous masses.

299. *Cinchona.*—Starch 4 μ in diameter, not very abundant; characteristic bast-fibres 600 μ long by 50 μ wide; alkaloids can be crystallized out sometimes by use of KOH.

300. *Horsenettle* (*Solanum Carolinense*).—Starch occurs in single (25 x 35 to 10 x 20 μ) or 2–4-compound grains; sklerenchyma and ducts.

301. *Phytolaccæ Radix.*—Acicular crystals 30 μ long or crystal sand; numerous starch grains 7–18 μ in diameter; large ducts; fragments of cork; sklerenchyma fibres short and long.

302. *Quassia* (*Surinam*).—See No. 358.

303. *Tinct. Cinchonæ Comp.*—Bast-fibres of *Cinchona* (see No. 303); parenchyma of *bitter orange peel* (see No. 206); sklerenchyma of Serpentaria (see No. 145).

304. *Zingiber* (*African*).—See No. 318.

(*b*) Containing starch, but few or no crystals of calcium oxalate and rather numerous fragments of tissues.

a. Possessing oil-cells or secretion reservoirs ∴ of characteristic odor.

305. *Calamus* (*unpeeled*).—The crystal fibres occur only in outer portion of cortex, hence powder may contain few crystals; starch 4 x 8 to 4 x 4 μ; ducts and sklerenchyma; loose parenchyma; colorless or slightly yellowish oil-secreting cells.

306. *Capsicum.*—Starch grains very small; peculiar wavy stone-cells of seed, besides stone-cells of epicarp and endocarp; oil containing dissolved pigment of chromoplastids; characteristic secretion hairs of calyx; powder with H_2SO_4 becomes purplish and then purplish-red.

307. *Colchici Semen.*—See No. 326.

308. *Cubeba.*—Starch 1–4 μ in diameter; occurring also in aggregated masses; stone-cells (50 x 50 μ), those of endocarp twice as long as wide; sklerenchyma fibres; needle-shaped crystals (cubebin) occur in stalk; much oil in numerous oil secretion reservoirs.

309. *Cinnamon.*—Crystals may not be observed. (See No. 292.)

310. *Piper nigrum.*—See No. 100.

311. *Sabina.*—Starch 4 μ; characteristic hypodermis consisting of long fibres (15 μ wide) associated with epidermis.

312. *Sanguinaria.*—Starch grains single (4–8 μ), seldom 2–4-compound; orange and reddish-colored secretion cells; mounts in glycerin are apt to contain sphere crystals.

313. *Sassafras.*—Starch grains single and 1–3-compound (7–20 μ diameter); bast fibres 455 μ long x 20–30 μ wide, being spindle-shaped much as in Cinchona; yellowish and purplish-yellow fragments containing tannin; oil-cells.

314. *Stillingia.*—Crystals may not be numerous. See No. 262.

315. *Sumbul.*—See No. 125.

316. *Syr. Trifolii Comp.*—See No. 263.

317. *Valeriana.*—Starch in single (7 μ) or 2–3-compound grains; oil in cells near hypodermis; peculiar cork; root hairs; sometimes in cells of epidermis or near them crystals (Valerianic acid salt) occur.

318. *Zingiber* (*African*).—Crystals likely to be overlooked. Distinguished from *Jamaica ginger* by possessing more numerous oil and resin cells and cork cells.

β. Sklerenchyma as stone cells or fibres.

319. *Aconiti Radix.*—Starch in single (4–12 μ) and compound grains, much resembling Colchici Cormis; tabular *stone cells;* ducts; reddish-brown endodermis; taste characteristic.

320. *Apocynum.*—Starch; sklerenchyma and laticiferous vessels; ducts with bordered pores. In *A. album* starch 4–10 μ; stone cells 35 x 70 to 50 x 70 μ, with few large pores; bast fibres may not react readily, if at all, with phloroglucin; wood fibres react with phloroglucin; thick cork. In *A. androsæmifolium* starch 4–20 μ; stone cells 13 x 10 μ, possessing numerous fine pores; bast fibres may be absent; when present, behave towards phloroglucin like *A. album.* In *A. Cannabinum* do not find stone cells or bast fibres; wood fibres are affected by phloroglucin; starch grains 7 x 15 to 10 x 10 μ, being larger than the other two; more numerous yellowish or

nearly colorless fragments of laticiferous vessels than in the other two; numerous fragments of the yellowish and reddish-brown cork.

321. *Black Mustard Hulls.*—Characteristic stone cells and pigment cells of seed coat.

322. *Capsicum.*—See No. 306, stone cells.

323. *Chenopodium.*—See No. 108, stone cells.

324. *Coffee.*—Characteristic fragments of seed coat made up of parenchyma and spindle-shaped stone cells (175–200 μ long and 35 μ wide); most of the cells are those of endosperm with brownish-colored walls, porous, 10 μ thick and contain oil, aleuron and starch. In commerce ground coffee is either made from the true coffee seed or is an artificial mixture of cereals, chicory, etc.

325. *Colocynthis.*—See No. 549.

326. *Colchici Semen.*—Starch 7–15 μ; characteristic thick-walled endosperm cells with simple pores and containing oil globules and protein; reddish-brown fragments of seed coat, the brown coloring matter soluble in KOH.

327. *Cubeba.*—See No. 308.

328. *Guarana.*—Parenchyma (60 x 70 μ) containing aggregated more or less altered starch grains (10 x 10 μ); stone cells (25 μ in diameter) nearly isodiametric; sklerenchyma fibres; on addition of KOH needle-shaped crystals (caffeine) may be obtained.

329. *Pareira.*—Yellowish stone cells (70 x 45 μ) occurring in groups; numerous starch grains, either single (7 x 10 to 15 x 15 μ) or compound; wood fibres.

330. *Physostigma.*—Starch, 25 x 40 μ; stone cells, also characteristic palisade sklerenchyma; stone cells, the contents of which are reddened by alkalies; oil and protein as granular masses.

331. *Phytolaccæ Radix.*—See No. 301.

332. *Podophyllum.*—Crystals sometimes apparently wanting; starch in single (5–8 μ) or 4 to 6 compound grains; numerous single cells or groups with yellowish resin; sklerenchyma fibres and ducts.

333. *Sassafras.*—See No. 313.

334. *Serpentaria.*—See No. 145.

(*c*) Containing starch; few tissue fragments and no calcium oxalate crystals.

335. *Amylum Iodatum.*—More or less angular grains (7–20 μ) of corn starch, colored uniformly dark blue; on focussing above on the grain the edge is light blue.

336. *Bryonia.*—Starch in single (10–17) or two or more compound grains; sometimes find long acicular crystals (200 μ); ducts, 35–60 μ wide; cork yellow and yellowish-colored cells, associated with ducts as in Colchici cormis; with H_2SO_4 powder colored purplish and reddish-brown.

337. *Colchici Cormis.*—Starch in single (7–15 μ) and 2 to 4 compound (35 x 35 μ) grains; sometimes find needle-shaped crystals (70–200 μ long); few spiral ducts (21 μ wide); with H_2SO_4 powder colored reddish-brown (port wine color).

338. *Opium.*—In glycerin mounts consists of more or less grayish-brown and irregular granular masses (35–50 μ in diameter); little or no starch; epidermis of capsule cells, 40 x 40 μ in width, having lumen 7 x 7 μ; taste bitter and sparingly soluble in water or KOH. May get test for alkaloids with use of KOH. The *Smyrna* opium has most epidermal cells of capsule; the *India* few or none, and the *Persian* very little. The *Persian* always has an appreciable amount of starch. (See also Tschirch.)

339. *Tonka.*—Numerous starch grains, either single (5 x 7 μ) or aggregated; parenchyma containing brownish-red coloring substance; much oil.

B. WITH LITTLE OR NO STARCH.

(*a*) Containing calcium oxalate crystals.

a. Crystals rosette or star-shaped.

340. *Anisum.*—See No. 8.

341. *Carum.*—Crystals (1 μ) in aleuron (3 μ); characteristic brownish oil secretion reservoirs and epidermis of seed coat and pericarp.

342. *Chimaphila.*—See No. 12.

343. *Conium.*—See No. 13.

344. *Coriander.*—Crystals (3 μ) in aleuron (10 μ); light yellowish oil secretion reservoirs, with epidermis of seed coat and pericarp.

345. *Cusso.*—Crystals (20 μ); spherical pollen grains (25 μ); single celled, non-secreting hairs (210 μ long); small secretion hairs with a stalk; stone cells.

346. *Cloves.*—Crystals, 10–15 μ; numerous secretion reservoirs (125 x 125 μ to 120 x 210 μ; pollen grains somewhat triangular (15 μ); parenchyma loose; few bast fibres with the bundle. Heat powder with KOH get needle-shaped crystals possibly due to eugenol.

347. *Clove Stems.*—Numerous rosette-shaped, but also cubical (7 x 7 μ) crystals; sklerenchyma fibres 30 μ wide; numerous *stone cells* (30 x 100 μ to 100 x 100 μ); oil secretion reservoirs not so large or numerous as cloves.

348. *Fœniculum.*—Crystals (2 μ) in aleuron 6 μ; brownish oil secretion reservoirs with characteristic inner epidermis of pericarp running at right angles to the same; thickened latticed parenchyma.

349. *Quassia* (Surinam).—See No. 358.

350. *Santonica.*—Crystals 10 μ; pollen grains, spherical (15 μ); sklerenchyma fibres; secretion hairs containing crystals (santonin) soluble in alcohol and ether; powder, with H_2SO_4, becomes immediately blood-red. Santonica distinguished from *Artemisia* by the characteristic T-non-secreting hairs of the latter.

β. Crystals cubical, tetragonal or prismatic.

351. *Aurantii Amari Cortex.*—See No. 206.

352. *Aurantii Dulcis Cortex.*—See No. 207.

353. *Gaultheria.*—See No. 17.

354. *Gentian.*—Contains some small colorless or yellow prismatic crystals (may be calcium oxalate); in glycerin large prismatic crystals (5 x 15 μ) separate (possibly a sugar); spiral (30 μ wide), and scalariform (50 μ wide) ducts; yellowish oil globules; powder with Fe_2Cl_6 dark brown; characteristic "ersatzfasern" accompanying the sieve.

355. *Hamamelis.*—See No. 33.

356. *Illicium.*—Prismatic crystals (4–10 μ) of a stearopten in inner epidermis of seed coat; most characteristic are the sklerenchyma, of which there are 3–4 forms, of these the palisade sklerenchyma is most characteristic; loose parenchyma; oil in cells. In *I. religiosum* the stone cells are thicker than *I. anisatum*, and on treatment with KOH the latter becomes port wine red and the former a dirty orange-brown.

357. *Insect Powder.*—See No. 19.

358. *Limonis Cortex.*—See No. 208.

359. *Quassia.*—Cubical crystals (15 μ) in wood parenchyma; ducts and wood fibre. The *Jamaica quassia* is distinguished from *Surinam*, in that the medullary rays of the former are 2–3 rows wide, whereas in Surinam they are but 1 row wide. In *Jamaica* we also find in addition crystal sand. When bark is ground with the

wood the *Surinam* powder is distinguished by the presence of stone cells and rosette-shaped crystals of calcium oxalate. The latter are found only to a small extent in *Jamaica*.

360. *Quercus alba.*—Cubical crystals (15 μ), in crystal fibres 20 μ wide; large groups of characteristic stone cells; long bast fibres, which are 40 μ wide; colorless or light yellow parenchyma stained deep black with Fe_2Cl_6.

361. *Sambucus.*—Small crystals in calyx. See No. 474.

362. *Uva Ursi.*—See No. 37.

363. *Vanilla.*—Crystals, tetragonal and prismatic (7 x 17; 10 x 25; 7 x 35 μ) or needle-shaped (200–300 μ long); characteristic papillæ upon inside of pericarp; characteristic broadly ovate, brown to brownish-black seeds with reticulate walls; lignified elements stained bright-red with phloroglucin; starch not found in ripe fruit. *Mexican Vanilla* has in connection with the elements of the fibro-vascular bundle, a characteristic netted-pored parenchyma cell, distinguishing it from the other vanillas. Vanilla distinguished from admixtures with *Tonka* by latter containing starch.

γ. Crystals in raphides.

364. *Vanilla.* See No. 363.

b Crystals in fine, sand-like particles.

365. *Cinchona.*—Contains small amount of starch. See No. 299.

366. *Quassia* (Jamaica).—See No. 358.

367. *Tobacco.*—Characteristic secreting and non-secreting hairs; sklerenchyma fibres; stomata characteristic.

(*To be continued.*)

GLEANINGS FROM THE MEDICAL JOURNALS.

BY CLEMENT B. LOWE, M.D.

THE REMOVAL OF WAX FROM THE EAR.

The *Indian Lancet* for June 16th, quoting the *Union Medicale du Canada* for January, states that Albert Ricci, of Turin, has ascertained that the solution of hydrogen dioxide possesses the peculiar quality of rapidly disintegrating the obstructive masses of cerumen in the ear. It suffices to pour into the *meatus auditorius externus* a *small* quantity of the solution, and leave it for a few moments in contact with the ceruminous plug. The latter is then most easily and safely removed by syringing with water, even though it were a hard concretion.

PRIZE FOR A METHOD FOR THE PURIFICATION OF DISTILLERY BY-PRODUCTS.

The North of Scotland malt distillers offer a prize of $10,000 for a successful method for the purification of waste products that polluted the streams of the North of Scotland until the Government interfered with the industry. The following is the offer open to chemists of the world: Distillery By-Products—The North of Scotland Malt Distillers' Association offer a premium of £2,000 sterling to any one devising and handing over to them for their sole use and behalf such a scheme for treating the by-products of distilleries, as will effectually purify them and be adopted by the Association. Samples of the by-products will be furnished and facilities given on application to the Secretary, D. Mustard. The by-products consist of:

(1) The spent-wash or "burnt ale" after distillation of the spirits. It usually has a specific gravity of about 1·004. It contains a sediment of exhausted yeast, fine particles of malt-dust, also mineral salts, acids, etc.

(2) The spent-lees from spirit-stills contain fusel oil, etc.

(3) The washings of fermenting vats, washing of casks from the cooperage.—*Philad. Med. Jour.*, July 2, 1898.

COBALT NITRATE IN CYANIDE POISONING.

The London correspondent of the *American Practitioner and News*, for June 1st, says that a chemist is stated to have found in cobalt nitrate an effective antidote for both hydrocyanic acid and cyanide poisoning. Successful in the first trial with animals, its application has been extended to some forty cases of poisoning among human beings, and proved successful.—*New York Med. Journal.*

RECENT LITERATURE RELATING TO PHARMACY.

SOLUBILITY OF IODINE AND BROMINE IN WATER.

F. Dietze (*Pharm. Zeit.*, 1898, p. 327) finds the solubility of iodine in water not to be 1 in 5,000, but, at ordinary temperatures, it is 1 in 3,500 to 3,750, and at 30° to be 1 in 2,200. For bromine the solubility is correct as given in the German Pharmacopœia, viz.: 1 in 30.

CAUCASIAN SARSAPARILLA.

In the South of Europe occurs a sarsaparilla called "Italian," which is yielded by *Smilax aspera*, and is used by the people as a medicine, though it does not contain any parallin. Ed. Lehmann calls attention (*Farmaz Westnik*, 1898, p. 1) to the Caucasian Sarsaparilla (the origin of which is *S. excelsa*), which somewhat resembles the American sarsaparilla, and may be employed as an efficient substitute. Chemically, it appears that the Caucasian sarsaparilla contains parallin, or at least a principle resembling the same.—*Chem. Zeit.*, 1898, p. 120.

CARDIOGYNE AFRICANA, BUREAU.

A new dyewood is recorded by A. Engler as being yielded by *Cardiogyne Africana* (N. O. Moraceæ) from the east coast of Africa. The thorny bush occurs in abundance. The outer portion of the bark is marked by deep, longitudinal fissures; the inner bark and the white splint wood are rich in a yellowish milk juice; the heartwood (which may have a diameter over 10 centimeters) is heavy and more or less red-colored. Linen is dyed of a beautiful light yellow color by means of alum and the heart-wood, and the article is not affected by soap.—*Chem. Zeit.*, 1898, 120, from *Notizbl. bot. Gart. u. Mus.*, 1898, II, 54.

VANILLIN IN OATS.

According to Olivier de Rawton (*Compt. Rend.*, T. 127, p. 197) there occur three crystallizable principles in oats, one of which yields upon oxidation, vanillin. Olivier believes this to be the stimulating principle of oats, inasmuch as horses fed with oats deprived of the pericarp do not respond as those fed otherwise, and the black oats of Bretagne, which are the most highly prized, yield more vanillin. In Normandy, horse dealers feed their spirited horses on the rhizome of couch grass. According to Olivier it is to the vanillin that triticum owes its stimulating properties, although there is here another glucoside which, upon oxidation, yields an aldehyde having the odor of Rosa gallica.—*Pharm. Zeit.*, 1898, 304.

EDITORIAL.

NEW ELEMENTS.

History is not only being made rapidly during the closing days of this century, but science is being remarkably enriched by the discoveries of particularly the last few years. It is only a few years since that Lord Raleigh and Professor Ramsay announced the discovery of an unknown element in the atmosphere. In the course of their experiments upon nitrogen, they found that "atmospheric nitrogen" had a greater density than "chemical nitrogen," and that this was not due to the presence of an impurity, but to the existence of a new element, which they called "*argon*." This was subsequently examined by Professor Olszewski, and its melting and boiling-points and critical temperature determined.

A few months after the publication of this work Professor Ramsay, when studying the nature of gases obtained by heating minerals, obtained *argon* from some, but he also obtained from a mineral brought from Sweden, a light, colorless gas, that was lighter than argon, and gave a different spectrum, and in particular gave a brilliant D_3 line in the yellow. This line had heretofore been noticed in the solar spectrum, and thirty years ago was attributed by Lockyer and Frankland to a hypothetical element, which they called "*helium*." There are certain analogies between argon and helium. (See this JOURNAL, November, 1895.)

Professor Ramsay and Mr. Travers have recently (June, 1898) communicated to the Royal Society the discovery of an additional gas in the atmosphere. This is heavier than argon and less volatile than nitrogen, oxygen and argon, and has received the name "*krypton*" (hidden). These two chemists continued these investigations, and later announced the discovery of two more constituents of atmospheric air. They liquefied large volumes of argon, using liquid air as the cooling agent. When argon was passed into a bulb cooled by liquid air, it formed a liquid in which a white solid appeared. By evaporation of the liquid they obtained a gas which behaves in a vacuum tube entirely differently from other known gases, and to which they gave the name "*neon*" (new). From the solid they obtained a gas which was entirely different from argon, although resembling it in general character. It possesses a different spectrum from argon, behaves differently at low temperatures, and the authors conclude that it is elementary, and call it "*metargon*." It holds the same position towards argon that nickel does to cobalt, having approximately the same atomic weight but different properties. There appears some doubt among certain investigators as Professor Schuster and Professor Dewar regarding the presence of metargon in argon, although the presence of krypton and neon are fairly well established.

Professor Nasini, of Padua, has been making some studies on the gases emanating from the earth in various portions of Italy. In a communication to the French Academy in July, he announced the discovery of a gas which had not been found before on the earth. The gases from the Solfotara di Pozzuoli contained a gas corresponding to the undiscovered element *coronium*, the specific gravity of which is lighter than hydrogen.

Charles F. Brush, at the Boston meeting of the American Association for the Advancement of Science, reported on some experiments which he has been car-

rying on in eliminating a gas from the atmosphere that is lighter than hydrogen, which is named "*etherion*." Its ability to conduct heat is 100 times as great as hydrogen, and it is probably not confined to the earth, but must reach out indefinitely into space.

Sir William Crookes, in his presidential address before the British Association for the Advancement of Science, communicated the results of the examination of some of the rare earths. "In the spectrum of a part of a specimen which had been isolated from the rest, he discovered lines that were unrecognizable. Eventually he found that he had discovered a new element, and he is now making investigations on it." Its atomic weight is 118. The characteristic lines of its spectrum are in the ultra-violet and stand alone, and from this latter circumstance has been called "*monium*."

"The appearance of so many new elements at one time will no doubt prove embarrassing with the present arrangement of the Periodic System, and attempts will probably be made to rearrange the system to conform to these new discoveries. Professor Crookes has suggested an arrangement of the elements in the form of a double spiral, in which the elements are arranged in three dimensions in space, the three elements discovered by Ramsay falling in the vertical column under helium between the hydrogen family, containing chlorine, bromine and iodine, and the lithium family."

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

PHARMACEUTICAL AND MEDICAL CHEMISTRY. VOL. I. General Chemistry. By S. P. Sadtler, Ph.D., F.C.S., and H. Trimble, Ph.M. J. B. Lippincott Company. 1898.

The appearance of a new edition of this most excellent work will receive a hearty welcome, particularly so since the authors have divided the bulky and expensive one volume into two convenient parts, each covering a distinctive field, Volume I being devoted to Elementary Physics with Inorganic and Organic Chemistry, while Volume II, which has just appeared, takes up Qualitative and Quantitative Analysis, with Pharmaceutical Assaying.

The thoroughness of this well-known work, with the clearness with which the subject matter is treated, leaves but little to criticise except it be in the introductory chapters on Physics and General Chemistry.

When we consider the growing importance of the subject of Physics in its applications to the study of chemistry, pharmacy and medicine, one is naturally surprised to see the entire subject condensed to within a space of ninety-one pages. In the endeavor to keep the work within a reasonable size, much descriptive matter, with many illustrations, have been omitted, which are actually indispensable for a clear and proper understanding of the subject. Space might have been economized in omitting a number of large illustrations devoted to pure technical operations, as "The Lime Kiln," "Lead Furnace," "Sodium Furnace," "Silver Cupellation Furnace," etc. For example, the entire subject of electricity is covered in sixteen pages, with but six illustrations. Under this sixteen lines have been devoted to explaining the system of telegraphy, twenty to the telephone, with about the same number to the principles involved in electrical heating and lighting, the dynamo, X-rays, etc. It is an impossibility for a beginner to form a tangible idea of these subjects

without proper illustrations and plans, particularly so when the subject matter is condensed into the smallest possible space.

In the introductory chapter on Chemical Theory many explanations lack illustration in the way of formulæ and equations. For example, under the definitions of the terms "hypo," "per," "ous," "ic" salts, examples of well known compounds might have been cited under each; again in explaining the nomenclature of the different compounds of chlorin and oxygen, were the several formulæ appended, the student would more readily grasp their meaning and relationship. The subject of acid anhydrides is missed.

In the explanation of the rules of nomenclature of the acids and salts, comparative tables would materially assist in systematizing the subject. The subject of "Chemical Reactions and Equations" has suffered much from condensation, more space should be devoted to giving the beginner a clear understanding of the conditions governing chemical reactions, the influence of heat, light and electricity on chemical combination and decomposition, rules of solubility, etc. One page is scarcely sufficient to clear up the subject of stochiometry in the mind of the average student, owing to the many different ways in which the subject may be presented. It might have been well to have added questions with solution wherever possible under the "practical exercises."

In the writer's opinion it would be far better, if space is the primary consideration, to cut down descriptive matter elsewhere, but under no circumstances should the introductory chapter embracing the fundamental principles of chemical theory be abridged.

The arrangement and classification of the subject matter of the chapters on Inorganic and Organic Chemistry is very systematic and, therefore, a great aid to the student in classifying his knowledge. Argon and Helium have found place in the revised text.

The older distinctions between a luminous and non-luminous flame based on the presence of solid incandescent particles might stand revision in accordance with the results of more recent investigations upon this subject.

Since the appearance of the first edition in 1895, a number of synthetic medicinal products have come into general use, these present exceedingly interesting material from a chemical standpoint. For example, the organic and colloidal preparations of silver, the organo-therapeutic agents, iodoform substitutes, local anæsthetics, etc., none of these have received any attention.

We miss among the proximate plant principles, allusions to the important investigations of Kiliani, which have accomplished so much to clear up our knowledge of digitalis; the same might be said of the solanaceous alkaloids.

A systematic table of color reactions for the identification of plant principles would be acceptable.

To the student, the index of his text or reference book is a very important feature, for, owing to his inexperience, he will seek his references in a very unsystematic manner, hence in view of this, the matter of synonyms and cross references should be well provided for. In this respect the index of the above work is deficient.

V. COBLENTZ.

A SHORT MANUAL OF ANALYTICAL CHEMISTRY, qualitative and quantitative, inorganic and organic. Following the course of instruction given in the laboratories of the South London School of Pharmacy. By John Muter, Ph.D.,

F.R.S.E., F.I.C., F.C.S., etc. Second American edition—illustrated. Adapted from the eighth British edition. Philadelphia: P. Blakiston, Son & Co. 1898. 8vo. Pp. xiii and 228.

The first American edition of this work was very favorably criticised at length in the October, 1891, number of this JOURNAL. The present edition has been made to correspond to the last revision of the United States Pharmacopœia. The book has also undergone some general revision. A few of the less important matters have been dismissed, but, by the addition of new matter, the book has been somewhat enlarged over the first edition. The important of these additions are in the sections devoted to the reactions of the alkaloids, to the qualitative detection of certain organic bodies commonly employed in medicine, to the analysis of fixed oils, fats, waxes, soap and essential oils; hence, the scope of the work has been extended. What was said seven years ago for the first edition is still applicable to the work, viz: "We regard the work as a very useful one, and as being well adapted for analytical work by students under supervision of an experienced teacher, and for a trustworthy guide to those who are not novices in chemical analysis."

J. C. P.

ESSENTIALS OF MATERIA MEDICA, THERAPEUTICS AND PRESCRIPTION WRITING, arranged in the form of Questions and Answers. Prepared especially for students of medicine, by Henry Morris, M.D. Fifth edition. Price, $1 net. W. B. Saunders. Philadelphia. 1898.

The reviewer of this little book believes with the author "that the time has come in scientific medicine when an attempt at classification, however imperfect and tentative, should be made, instead of giving up the whole subject as hopeless and arranging the remedies in alphabetical order; and, consequently, finds in this compendium much to commend it to the student of medicine, provided it be kept in its proper place. While not written from the standpoint of the pharmaceutical student, it possesses several features that would render it useful to him as well. These features are the prominence given the official names of the drugs and preparations of the Pharmacopœia, the expression of doses in the metrical system of weights and measures, as well as in the older apothecaries' weight and wine measure, and the brief but lucid description of the physiological action of the drugs treated of, as well as their toxicological symptoms and antidotal treatment, this last being especially helpful to the pharmaceutical student. The young practitioner may also find in its pages many practical suggestions of value, both in therapeutic hints and prescription writing, especially as regards the incompatibilities, a subject that so frequently occasions the young physician so much annoyance. The adverse criticism the reviewer feels inclined to make is as to the arrangement of the subject-matter in the form of questions and answers, but as this criticism would apply to the whole series rather than to this book in particular, it does not militate against what has been said in its commendation.

J. L. D. M.

A TEXT-BOOK OF MATERIA MEDICA, THERAPEUTICS AND PHARMACOLOGY. By George Frank Butler, Ph.G., M.D. Second edition, revised. Philadelphia: W. B. Saunders, 925 Walnut Street, 1898. Cloth, $4.00; sheep, or half morocco, $5.00, net.

This work savors of the product of a man of considerable experience, and one who has asked and followed the counsel of maturer minds. The work has been written with the immediate object of supplying the student in medicine with a clear, concise and practical text-book, adapted for permanent reference no less than for the requirements of the class-room. It, however, has much in it to commend it to the pharmacist. There are no less than about eighty pages devoted to the consideration of "Weights and Measures" and "Pharmaceutical Preparations," which were written by Prof. C. S. N. Hallberg. We notice the substitution of a chapter on the "Untoward Effects of Drugs" for that on Definitions. This is an innovation which will commend itself to all, as a series of tables are also furnished which will enable one at a glance to secure the information desired.

Excellent well-digested chapters on Serum-therapy and Animal Extracts (organotherapy) will undoubtedly serve to enhance the value of the work. The drugs are considered according to their physiological action, but there is also incorporated under each drug its synonyms, origin, description and properties, preparations, dose, administration, therapeutics and physiological action. A chapter on Prescriptions and two rather comprehensive indices—(1) clinical and (2) general—complete the volume.

The second edition has been carefully revised, and will doubtless be even more favorably received and appreciated by medical teachers, students and physicians generally, as well as the busy pharmacist who needs a work of this kind for general reference at least.

KING'S AMERICAN DISPENSATORY. New edition. Entirely rewritten and enlarged. By Harvey W. Felter, M.D., and John Uri Lloyd, Ph.M. Two volume edition, royal octavo, each volume containing over 950 pp., with complete indexes. Cloth, $4.50 per volume post-paid. Sheep, $5 per volume post-paid. Volume I now ready. The Ohio Valley Company, Publishers, Cincinnati, O.

This new edition of King's American Dispensatory will be much appreciated by those who have been anxiously awaiting its appearance. The pharmacy and chemistry of the work have been rewritten by Professor Lloyd, and to Professor Felter has been assigned the entire medical section, as well as that portion embracing the botany, botanical history and botanical description. There are 115 illustrations in Vol. I, all of which, with very few exceptions, have been taken from various sources.

The work appears to have been brought up to date by the incorporation of the results of the more recent investigations, and will prove to be a useful adjunct to the reference library of the physician and pharmacist. We reserve, however, a more extended review of this work until Volume II appears.

MINUTE OF MEETING OF MEMBERS OF THE COLLEGE.

PHILADELPHIA, September 26, 1898.

The stated quarterly meeting of members of the College was held this day. Charles Bullock presided. The minute of the previous stated meeting was read and adopted. The minutes of the Board of Trustees of the previous meetings

were also read and approved. A report of the delegates to the sessions of the American Pharmaceutical Association, recently held in Baltimore, was made verbally by Mr. Boring. This was supplemented in a few words by Professor Remington, who referred to the fact of the presence at that meeting of a considerable number of the older druggists of the country. Allusion was also made to the prevailing sentiment that hereafter no person should be permitted to go before the examining Boards of Pharmacy who does not hold the diploma of an accredited college. Also that in reference to the trade conditions of the Retail Branch of Pharmacy the existent evils and errors should be remedied by united individual or associated action. The Secretary read a letter from Dr. F. Hoffman having reference to the loss sustained in the death of Henry Trimble. A memoir of Henry Trimble was read by Professor Remington, from the committee to whom the subject was referred. Which memoir was referred to the Committee on Publication of the JOURNAL, and reference to it ordered to be made upon this minute.

It is as follows :

Henry Trimble was born May 22, 1853, at Chester, Pa., and died August 24, 1898, at his home at St. Davids, Pa. He was a son of Stephen M. Trimble, and received his early education at the famous Westtown School, near West Chester. He began his apprenticeship in the drug business in 1872 with S. Mason McCollin, at the corner of Fifth and Callowhill Streets. He matriculated as a student at the Philadelphia College of Pharmacy in 1874, and developed a fondness for chemical research. He graduated with the Class of 1876, his thesis being "Benzoic Acid as an Antiseptic." Organic chemistry especially interested him, and, entering the University of Pennsylvania, he pursued his studies in this department of science. For a time he acted as an assistant to the Chair of Organic Chemistry. For five years, from May 28, 1878, he was in the retail drug business, associated as partner with C. W. Warrington. Professor Sadtler, in 1879, chose him as his assistant at the Philadelphia College of Pharmacy in his work in the chemical laboratory, and in 1883, Professor Trimble was given charge of this department. His fifteen years of faithful work in analytical chemistry greatly contributed to the success of the College.

Professor Trimble possessed an investigating mind, and, being a careful observer, he never failed to impress upon all students entrusted to his care the value of being absolutely certain of the underlying facts in any research in which they were engaged.

In chemical research his name will probably be associated for years to come with the *tannins*, and it is not too much to say that he made himself an authority upon this important group, having correspondents in all parts of the world on this subject. As an author, he will undoubtedly be best known by his "Handbook of Analytical Chemistry," first published in 1885, and afterward merged into the now well-known "Text-Book of Chemistry," by Sadtler and Trimble, a new edition having just been published.

In College affairs, in addition to his teaching duties, we find him, as always, faithful, painstaking and industrious.

In 1877 he was elected a member of this College, and in the same year he was elected a member of the Executive Board of the Alumni Association, and has been a member of both ever since. He was made Vice-President of the Alumni Association in 1880, and in 1881, President of the same body. He was

elected a member of the Board of Trustees of the College in 1884, and served in this capacity fourteen years.

Upon the death of Professor Maisch in 1883, he was elected Editor of the AMERICAN JOURNAL OF PHARMACY, and his contribution of papers to this JOURNAL number thirty-six, and five papers associated with other writers. In addition to this, Professor Trimble wrote many book reviews and editorials. As a writer he was clear, forcible and convincing. He was indefatigable in inducing others to attend the pharmaceutical meetings of the College, and in securing papers and in fostering an interest among the students in recording and writing up the results of their work to add to the value of these meetings; afterward these contributions were usually found in the pages of the AMERICAN JOURNAL OF PHARMACY.

The labors of Professor Trimble were not confined to College and editorial work. He found time to contribute papers upon botanical subjects to various journals, and to the American and Pennsylvania Pharmaceutical Associations he was well known as a contributor of papers, and an active worker on committees.

He lectured upon chemical subjects one winter at the Franklin Institute, and was elected a member of the American Philosophical Society, in 1897. He was also a member of the American Chemical Society, of the London Society of Chemical Industries, of the London Chemical Society, and the Deutsche Chemische Gesellschaft.

By the death of Professor Trimble pharmacy has suffered a great loss. A consistent member of the Society of Friends, through inheritance and education, he possessed the valuable traits of the typical Friend. Always opposed to ostentation, he quietly pursued the path which he believed to be the one marked out for him. His opinions always commanded respect, and those who knew him intimately enjoyed the keen sense of humor with which he was gifted. His integrity was unquestioned, his character beyond reproach. While science has lost a faithful investigator, the College a devoted worker, he leaves to his wife and children a sweet memory of a devoted, loving father.

WM. B. THOMPSON,
Secretary.

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, October 18, 1898.

The series of Pharmaceutical Meetings for 1898–99 was inaugurated on Tuesday, October 18, at 3 P.M., in the Museum of the College.

The audience was a representative one, and it is hoped that the interest manifested at this first meeting may be continued throughout the series.

The chairman of the committee having charge of these meetings, Prof. Henry Kraemer, made some introductory remarks, first of a general character, and then he alluded to the work of the former chairman of the committee, the late Professor Trimble, in his untiring devotion to the cause of pharmaceutical progress. He thought that the example furnished by the life and work of Professor Trimble should be an inspiration to those present not only to do as well as he did, but to do even better if possible.

Dr. C. B. Lowe having been asked to take the chair, the consideration of

papers was begun. Prof. Joseph P. Remington having continued his experiments with acetic acid as a menstruum and solvent, presented a paper entitled "Fluid Acetracts" (see page 543). The subject is one fraught with interest not only from the pharmaceutical standpoint, but is of commercial importance as well, and aroused considerable discussion.

In reply to a question by F. X. Moerk, as to the keeping qualities of fluid acetracts, Professor Remington said that this series of preparations required as much individuality and study on the part of those engaged in their manufacture, as the alcoholic preparations required to bring them up to their present standard of efficiency. Hot weather does not appear to affect their stability, some of the samples having been kept for five years. For some preparations, a 10 per cent. acetic acid menstruum was found to be too weak. Others participating in the discussion of the paper were Thos. S. Wiegand, Wallace Procter, F. W. Haussmann and the chairman.

F. W. Haussmann presented a contribution on "The Inversion of Cane Sugar in Official Syrups," which will be published in a subsequent issue of this JOURNAL. The results obtained by the author showed that free mineral acids have a pronounced influence in inverting the cane sugar present in syrups, and indirectly in causing the change of color so often noticed in these preparations. Free organic acids also cause the formation of sugars having a reducing action on Fehling's solution. Furthermore, it was observed that syrups which contain no free acid do not show the presence of more than small amounts of reducing sugars either in freshly made samples or in those which have been kept for some time.

Several practical points were brought out in the discussion of this paper. Remarking upon the question of gastric irritation caused by the administration of syrups, Professor Remington did not think it likely that the small amount of laevulose present would cause the trouble, but that it was probably due to other constituents. Continuing his remarks, he said that recent investigations in regard to the effects of glucose on the animal economy had confirmed the view that it is far more wholesome than saccharose as an article of food, and that there is evidence of its growing in favor in this respect.

Dr. C. A. Weidemann said that he had suffered considerable loss from the darkening of syrups, and suggested the use of rock candy in their preparation, which he had found to be more successful.

Mr. Haussmann maintained, however, that the prevention of change of color was impossible unless something other than sugar was used. Syrups made with glycerin and saccharose did not deposit, but became darker. He said that the only remedy was a cool temperature.

The following members also took part in the discussion: Professor Moerk, Messrs. England, La Wall, Procter, Boring and the chairman.

An interesting part of the program was that devoted to an expression of opinion concerning the Baltimore meeting of the American Pharmaceutical Association. The speakers all expressed themselves as having very much enjoyed the hospitality of the pharmacists of Baltimore and the social features of the meeting. The work accomplished by the several sections of the Asso ciation was also spoken of in high terms and as giving evidence of progress along their respective lines.

An exhibition of botanical and drug specimens next occupied the attention

of the meeting. These included a growing plant of Barbadoes Aloes together with a sample of the drug of this plant, and a sample of the bean of Entada scandens, sent by Prof. J. U. Lloyd; samples of powdered drugs and spices from Gilpin, Langdon & Co.; specimens of some of the newer botanical drugs, such as Blood-flower, *Asclepias curassavica*, Lin., *Embelia ribes*, Burm., Hysterionica, *Haplopappus Baylahuen*, Remy, Horse-nettle berries and root, *Solanum carolinense*, Lin., Mountain Sage *Sierra Salvia*, *Artemisia frigida*, *Willd.*, Muirapuama, *Newbouldia laevis*, Seem., *Orthosiphon stamineus*, Benth. (Java Tea), Saw Palmetto, *Serenoa serrulata*, Benth. and Hook. from Parke, Davis & Co. Samples of both "wirey" and "fancy" Ipecac and one of German ergot from Richard Shoemaker; a sample of "Quebracho gum" which chemically, closely resembles kino, and a specimen of "Gogo," a Philippine Island drug (already referred to in the September number of this JOURNAL, page 480), from E. H. Gane, now of New York; a specimen of the fruit of a species of Martynia produced by a plant grown in Camden, N. J., and described by F. X. Moerk; and a specimen of the flower and leaf of a hardy Datura brought from Ridley Park, near this city, by Miss C. J. Taylor.

On motion, the meeting adjourned.

THOS. S. WIEGAND,
Registrar.

Fehling's Solution for Urine Analysis.—J. B. Tingle (*Amer. Chem. Jour.*, 1898, p. 126) recommends the Pary solution modified by Purdy, in which the tartrate is replaced by glycerol. The composition is given of the solution which is especially designed for urine analysis.

Coloring Principle of Uva Ursi.—According to A. G. Perkin (*Chem. News*, 1898, p. 208) there is present in the leaves of *Arctostaphylos uva ursi* a yellow coloring principle of the composition, $C_{15}H_{10}O_7$, crystallizing in glistening yellow needles; this forms an acetyl compound, $C_{13}H_5O_7Ac_5$, melting at 188°–190°. On fusion with alkali, phloroglucinol and protocatechuic acid were formed. Though resembling quercetin in these points, it has the property of forming deep green solutions with dilute potassium hydrate. Oxidation in alkaline solution did not destroy the green coloration until complete decomposition of the coloring matter had taken place. The presence of ellagic acid has also been detected, and thus besides gallotannin, ellagitannin is also present. Broach leaves contain the same coloring matter.

A Fish Poison.—The natives of Surinam, according to Pool (*Pharm. Centralh.*, 1898, p. 282), whip the water with the wood of a tree, *Lonchocarpus violaceus Bth.*, N. O. Leguminoseæ. The wood is called by the natives "Nekoe," and by the Europeans, "Stinkwood." It has a disagreeable odor, and is supposed to contain a substance possessing a narcotic action on fish.

NOTES AND NEWS.

Guaiacum of lower grade has been offered at the drug auctions of London mixed with the seeds of *Anacardium occidentale.—Chem. and Drug.*, 1898, p. 253.

Coley's Fluid is the name given to the mixed toxins which are being used by Dr. Coley, of New York, as an injection in inoperable sarcoma, with considerable success.—*Ibid.*, p. 347.

Cod Liver Oil of good quality is demanded by the customers of the retail druggist. The Lofoten cod liver oil is palatable, and its consumption in the United States is steadily increasing.

The Ovoid Cardamom is the fruit of *Amomum medicine* Low., and is a native of Southwestern Kwangsi, as well as of Tonquin. The centres of export by the West River are Nan-ning and Po-sê.—*Pharm., Jour.*, 1898, 226.

Gas Pipes out of Paper are being made in England. These are made from cellulose paper and coated with asphalt. They are said to withstand a high pressure and to be less affected by temperature and not affected by electrical currents.

Seedless Raisins.—In California there were experiments in stoning raisins so as to have them as free from seeds as the ordinary currant. Success has followed, till now seedless raisins are becoming an important item among the fruit industries of California.—*Meehans' Monthly.*

Fuller's Earth in California.—An immense bed, apparently inexhaustible, of fuller's earth has been found in San Bernardino County, Cal. The earth is considered at least equal, and possibly superior, to that imported from Great Britain.—*Chem. and Drug.*, 1898, p. 337.

Agar-Agar as an Ointment Base.—Gallois (*Bull. gén. de Therap.*) recommends the use of agar-agar jelly as an ointment base. Small portions of this rubbed on the affected area quickly dry, giving a closely adherent film. It possesses the great advantage over gelatin that in drying on the skin it does not contract.

The Cultivation of the Nutmeg Tree in Ceylon is undertaken very tardily. The yearly exports from that island amount to only about 4,000 to 7,000 pounds. It is now reported that a crop has been gathered in the lower country districts of Kurunegala and Kelain Valley within five years, being at least five to ten years earlier than the time usually required for these trees to bear. —*Chem. and Drug.*, 1898, p. 360.

To Destroy Ants in Lawns.—The following recommended formula for the destruction of ants is given in *Meehans' Monthly* in response to the inquiry of a subscriber: Mix one tablespoonful of bisulphide of carbon in two or three gallons of water. Pour this into holes six inches deep and twelve inches apart, filling in the holes immediately after this has been done. The fumes penetrate the soil and destroy the ants.

Quinoral is a neutral solution of quinine, soluble in water and alcohol, and said to be free from the effects on the heart caused by chloral and quinine.

Bacteriological experiments showed that with quinoral bacteria were more rapidly killed than with sublimate. It is employed in doses of 0·05 to 1·0 gramme; it acts as a hypnotic, especially in delirium tremens in larger doses. —*Zeitsch. d. Allg. Oest. Apoth. Ver.*, 1898, p. 754.

Parasitism.—Ribbert compares neoplasms to parasites, finding strong analogy in the growth of the former, their independent character, and in the manner in which metasis develops. Tumors, according to him, always grow through a proliferation of their own cells and displace and invade the neighboring structures without transforming them into neoplastic tissue.—*Univ. Med. Mag.*, 1898, p. 554; from *Deutsche Med. Wochenschr.*, March 17, 1898.

Bacteria in Holy Water.—A continental bacteriologist has found in the holy water in use in one of the most popular churches of Sassari not only staphylococci and streptococci, but also the bacillus of diphtheria and colon-bacilli, which frequently produce appendicitis. The presence of the diphtheria bacillus is supposed to be due to the custom of the worshippers touching their lips as well as other parts of the face with the consecrated water.—*Chem. and Drug.*, 1898, p. 337.

The Toxic Ptomaines of Preserved Meat, when found in hams, game pies, etc., are due, according to Van Ermenglin (*Jour. Pharm. Chem.*, 1898, p. 88), to the presence of a specific organism, *Bacillus bolulinus*. The soluble toxin (boluline) is extremely potent: $\frac{1}{1000}$ part of a milligramme killed a rabbit in twenty-four hours. Fortunately, however, this ptomaine is destroyed at a temperature of 60°–70° C., and the bacillus which produces it at 85° C., so that thorough cooking will remove all dangers in the case of salted or smoked meats. —*Pharm. Jour.*, 1898, p. 217.

Doctors Dispensing.—The medical syndicate of Ronbaix has addressed a circular letter (*Chem. and Drug.*, 1898, p. 148) to the new Chamber of Deputies in which they ask the Deputies, when discussing the new Pharmacy Bill, to introduce a clause specifying that the holder of a double diploma must decide which profession he will exercise. It is pointed out that where medicine is prescribed and dispensed by the same person, no written prescription is necessary, and in a poisoning case it would be very difficult to get at the real facts. Again in many cases the pharmacist, by pointing out a slip of the pen of the doctor, may avoid fatal consequences.

Birch Leaves as a Diuretic.—Huchard confirms the statement of Winternitz that a decoction of birch leaves acts as a useful diuretic. In order to render the resinous matter soluble, Moreau recommends the use of a little sodium bicarbonate. The decoction is made thus: From 10 to 15 grammes of the leaves are boiled in 1,000 c.c. of water, then cooled to 30° or 40° C. and 1 gramme sodium bicarbonate is added. Instead of this decoction, an extract, made by percolation with alcohol from the leaves gathered from the flowering tree, is given in pills in a daily dose of 1·6 to 2·4 grammes.—*Pharm. Jour.*, 1898, p. 237; from *Rép. de Pharm.*, X, 24, after *Jour. des Pract.*

Gonococcus Culture and Toxin.—A. Wasserman has directed his attention to a study of the toxic effects of this micro-organism. The gonococcus is pathogenic for mice, etc., but does not cause infections, only an intoxication. The

poison—*gonotoxin*—is contained in the bodies of the bacteria and not in the culture medium. Injected subcutaneously into human beings the toxin produces a painful induration, with slight rise of temperature, malaise and joint pains, all symptoms disappearing in two days. Immunity could not be produced either in man or in animal.—*Univ. Med. Mag.*, 1898, p. 567; from *Zeitschr. f. Hygiene und Infectionskrank.*, April, 1898.

Cultivation of Henbane and other herbs has been carried on successfully by George Allen & Co., of Ampthill, Bedfordshire, England. This firm has had many years' experience in the growth and culture of medicinal herbs, and Lehn & Fink are the sole agents for the United States. Their preparations, particularly of belladonna, digitalis, conium, hyoscyamus, stramonium, scoparius, etc.,

Crop of Henbane, second year biennial plant.

according to the *Chemist and Druggist*, represent excellent preparations from drugs which exhibit full care in harvesting and drying. The illustration represents a crop of henbane of this firm. They grow or collect all those medicinal British plants which are required for the preparation of green and other extracts, juices, liquors, confections, etc.

Immunity to Viper Poison.—An extraordinary immunization to snake-bite is reported by Phisalin (*The Therapist*, 1898, p. 142) by the use of *cholesterin extracted from gall-stones*. Vegetable cholesterin extracted from the common carrot had previously been demonstrated to possess similar properties. Tyrosin has lately been tried for viper poison with much success. *Vegetable tyrosin* abounds in the dahlia, and Phisalin found that by injecting a juice from the tubercles of the dahlia he imparted all the immunity conferred by tyrosin. As this quantity of the dahlia juice would contain but little tyrosin, he concludes that some other immunizing principle is contained in it. This

is said to be the first known example of a vegetable juice conferring immunity against venom.

Pa-Chioh is the Chinese name for Star aniseed, signifying "eight horns or corners," from the shape of the fruit. The tree which produces this fruit, according to A. Hosie, occupies a comparatively small area, being confined to Tonquin and the southwest of Kwangsi. The bulk of the star aniseed trade has hitherto passed through the port of Pakhoi, and in 1896 Pakhoi exported 6,691 piculs of the value of 113,817 Haikwan taels. This, as well as the oil extracted from the seeds (2,053 piculs valued at 410,692 Haikwan taels) was sent to Hong Kong, while 69 peculs of oil, of the value of 15,552 Haikwan taels, passed Lungchow for Tonquin. It is stated that, owing to the destructive method of collecting the fruit, there is a good crop only once in three years. Complaints have been made that the oil is adulterated with kerosene.—*Pharm. Jour.*, 1898, p. 226.

The Cassia Producing Districts of China are situated in the southern border lands of Kwangtung and Kwangsi provinces, in the south of the West River. The market town of Ta-wu, in the Pinguan district is the great centre of the cassia trade, where 50,000 to 60,000 piculs are annually disposed of. It is exported, packed in matting, by junk to Canton, where there is a powerful cassia ring, which has an arrangement with the native custom house and likin offices, and virtually controls the whole trade of Kwangtung and Kwangsi. The total export of cassia, including cassia lignea, buds, twigs, twig-bark and broken cassia, from the two provinces through Canton in 1896 amounted to 102,810 piculs, valued at 590,798 Haikwan taels; of so-called cinnamon, 99 piculs, valued at 4,801 Haikwan taels were also exported, as well as 398 piculs of leaf oil of the value of 56,484 Haikwan taels, making a total of cassia and cassia products of 653,083 Haikwan taels. China is reported to consume very much more than she exports, so that the total value of the cassia trade must be very considerable.—*Ibid.*, 226.

The Relation of the Taste of Acids to their Degree of Dissociation.—Theodore William Richards (*Am. Chem. Jour.*, **20**, 121–126) finds that he can just detect, by tasting, the acidity of a nearly one-thousandth normal hydrochloric acid solution, and can distinguish weak solutions differing from one another in concentration by 25 per cent.; and he shows that tenth-normal acid can be titrated with alkali with an error of less than 1 per cent., using the sense of taste as an indicator of neutrality. The sour taste of different acids was not found to be proportional to their degree of dissociation; for example, a 0·001 normal hydrochloric acid had a taste like that of an acetic acid solution three times as strong, although the concentration of the hydrogen ions in the former solution is about five times as great as in the latter solution. It was further found that, in accordance with the laws of mass-action, sodium acetate greatly diminished the sour taste of acetic acid, though not as much as the theory requires, while potassium chloride has no influence on that of hydrochloric acid.—*Journal of the American Chemical Society*, May, 1898.

LITERATURE.

The Price-List of Parke Davis & Co. for 1898 contains useful information on many of the newer drugs and remedies. The table of synonyms will be found particularly helpful to all retail pharmacists.